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BARBADOS

ANNUAL REPORT
OF THE
DEPARTMENT OF SCIENCE
AND AGRICULTURE
FOR THE YEAR
1953—1954

ADVOCATE CO., LTD.—PRINTERS



BARBADOS

ANNUAL REPORT

OF THE

**DEPARTMENT OF SCIENCE
AND AGRICULTURE**

FOR THE YEAR

1953—1954

DEPARTMENT OF SCIENCE AND AGRICULTURE

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Plant Diseases Inspector	..	..	..	D. R. D. WILES, D.I.C.T.A.
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Agricultural Assistant	..	..	..	..	..	L. H. ATKINSON
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Farm Overseer, Pine Plantation	..	..	..	..	..	M. E. MURRELL
Senior Peasant Agricultural Instructor	..	..	..	..	..	C. A. E. BECKLES, D.I.C.T.A. (Ag)
Senior Peasant Agricultural Instructor	..	..	..	..	..	L. T. TALMA
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Peasant Agricultural Instructor	..	..	..	..	..	G. B. PILGRIM
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do.	do.	do.	..	..	..	F. M. CUMMINS
do.	do.	do.	..	..	..	V. F. GAY
do.	do.	do.	..	..	..	A. YARD
do.	do.	do.	..	..	..	E. G. ST. JOHN
do.	do.	do.	..	..	..	H. DAC. SEALY
do.	do.	do.	..	..	..	C. V. DRAYTON
do.	do.	do.	..	..	..	C. A. RILEY
do.	do.	do.	..	..	..	A. J. BELLAMY

Peasant Agricultural Instructor	J. E. WASON
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do. do. do.	E. L. MURRAY
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Analytical Assistant	R. E. BARROW
do. do.	K. H. STREAT
do. do.	D. A. WICKHAM
Entomological Assistant	W. HEADLEY
do. do.	V. E. JAMES
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Entomological Laboratory Attendant ..	A. GITTENS
Overseer—Codrington Station	F. A. PERKINS
Field Superintendent	F. A. JORDAN
Agricultural Department Messenger ..	G. BARKER
Government Laboratory Messenger ..	L. H. MOORE

COLONIAL DEVELOPMENT & WELFARE SCHEMES

Scheme D.217 — Agricultural Development.

Secretary, Barbados Dairy and Stock Breeders' Association	J. R. PETERKIN
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Mr. C. C. Skeete, O.B.E., B.A., Director of Agriculture, proceeded to the United Kingdom on 11th May, 1953 on 123 days' vacation leave. He resumed duty on 10th September.

The Director of Agriculture attended the opening ceremony of the Eastern Caribbean Farm Institute in Trinidad on the 4th March, 1954, and a meeting of the Governing Body of the same Institute on the 5th and 6th March.

Mr. W. V. Rose, B.A., Deputy Director of Agriculture, acted as Director of Agriculture while the latter was absent from the island on both occasions.

Dr. M. B. Proverbs, M.R.C.V.S., Veterinary Officer, left the colony on the 9th July, 1953, for the United Kingdom where he spent 147 days' vacation leave and seven days' duty leave. During this period he attended the Veterinary Congress which was held at Stockholm, from August 9—15th. He also visited the Wellcome Veterinary Research Institute at Tunbridge Wells and the Laboratory of the Ministry of Agriculture at Weybridge. His duties as Veterinary Officer were performed by Dr. P. G. Scoggins, Assistant Veterinary Officer.

At the request of the Dominica Government, Dr. Proverbs paid a visit to Dominica for one week in mid June 1953 for advisory purposes in connection with the husbandry, management and breeding of livestock.

Mr. W. R. V. Lort, M.A., who was selected for appointment to the post of Cultivation Officer, arrived from England on the 24th August, 1953, and assumed duty the same day. Mr. Lort, however, tendered his resignation with effect from the 3rd October, 1953, and left the island.

Mr. D. W. Wiles, Fishery Officer, attended the First Caribbean Fisheries Seminar which was held at Kent House, Trinidad, on July 6th and 7th, 1953, and the Sixth Annual Session of the Gulf and Caribbean Fisheries Institute which was held at Miami Beach from November 16th to 20th.

Mr. D. R. D. Wiles, Plant Diseases Inspector, was seconded to the post of Senior Agricultural Assistant, Carriacou, for a period of three years with effect from the 27th of September, 1953.

Messrs L. T. Talma, G. A. Ramsay and C. D. Spooner, Peasant Agricultural Instructors, were promoted to the office of Senior Peasant Agricultural Instructors created by the Civil Establishment (General) (Amendment) No. 3 Order, 1953. The appointments were made retroactive from the 1st April, 1952.

Mr. V. G. M. Worrell, Long Grade Clerk, Government Electrical Inspector's Department, was transferred to the Department of Science and Agriculture with effect from the 1st April, 1953.

BRITISH WEST INDIES CENTRAL SUGAR CANE BREEDING STATION

ADVISORY COMMITTEE

- Chairman— C. C. Skeete, O.B.E., B.A., Director of Agriculture, Barbados.
- Members — Dr. G. A. C. Herklots, M.Sc., Ph.D., Principal of the Imperial College of Tropical Agriculture, Trinidad.
- C. H. B. Williams, M.A., A.I.C.T.A., Director of Agriculture, Trinidad.
- R. F. Innes, B.Sc., A.R.I.C., Director of Research, Sugar Manufacturers' Association (of Jamaica) Ltd., (Nominee of the Director of Agriculture, Jamaica).
- H. H. Croucher, B.Sc., A.I.C.T.A., Director of Agriculture, British Guiana.
- E. R. H. Martin, D.I.C.T.A. Acting Agricultural Superintendent, Antigua.
- Sir John Saint, Kt., C.M.G., O.B.E., Director, Sugar Technology Laboratory, Barbados.
- M. A. G. Hanschell, B.A., Dip. Rural Econ., Director of Agriculture, Grenada.

STAFF

- Cytogeneticist — G. C. Stevenson, B.A., A.I.C.T.A.
- Botanist — B. deL. Inniss, B.Sc., A.I.C.T.A.
- Agricultural Assistant — N. L. Foster
- do. do. — C. D. Gilkes
- do. do. — A. N. C. Hewitt
- Statistical Clerk — E. L. Jones
- Stenographer-Typist — Miss S. O. Maxwell

BOARD OF AGRICULTURE

The members of the Board of Agriculture appointed for the Legislative Session 1953-54 were as follows:—

The Hon. G. D. L. Pile, O.B.E., M.L.C., Chairman.

„ „ J. A. Mahon, M.L.C.

Sir John Saint, Kt., C.M.G., O.B.E.

F. L. Walcott, Esq., M.C.P.

E. St.A. Holder, Esq., M.C.P.

J. A. Haynes, Esq., B.A., M.C.P.

L. E. Smith, Esq., M.C.P.

C. O. Armstrong, Esq.

The Director of Agriculture is ex-officio member of the Board.

REPORT ON THE WORK OF THE DEPARTMENT OF SCIENCE AND AGRICULTURE FOR THE YEAR ENDING 31ST MARCH, 1954

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PART I

SUMMARY OF AGRICULTURE POLICY

1. The conservation of soil and the maintenance and improvement of soil fertility.
2. The control of pests and diseases of crops.
3. The improvement of crop yields by selection and breeding.
4. The maintenance of a sound animal husbandry industry as an integral part of the farming system.
5. The development and improvement of the Fishing Industry.
6. The encouragement of the production of local food crops, especially green vegetables.
7. The stimulation of co-operative ventures, particularly amongst small-holders.
8. The development of irrigation in suitable areas.

PART II

GENERAL

I. WEATHER CONDITIONS DURING THE YEAR

Detailed climatic data in respect of the current year 1953, as recorded at the Meteorological Station at Codrington, St. Michael, are given in Appendix I to this Report. Water is the principal factor limiting plant growth in Barbados, and since the water supply is almost entirely dependent on rainfall, the monthly average rainfall for the Colony is an important item to record. The average rainfall for the period December 1951—March 1953, which covers the growing period of the plant cane, compared with the average rainfall for the two previous fifty-year periods, is set out in Table I.

TABLE I

MONTH	Rainfall In Inches		
	Average		Average 1951-53
	1851-53 to 1900-02	1901-03 to 1950-52	
December	4.89	4.60	8.65
January	3.72	3.10	0.65
February	2.26	2.13	0.58
March	1.97	1.90	2.64
April	2.45	2.21	2.84
May	3.60	2.66	3.04
June	5.69	5.13	5.38
July	6.27	6.16	5.67
August	7.81	7.02	3.47
September	8.17	7.35	7.21
October	8.09	7.44	9.07
November	8.02	7.72	7.48
December	4.92	4.61	3.54
January	3.72	3.07	3.35
February	2.24	2.13	2.11
March	1.97	1.93	2.04
	75.79	69.16	67.72

The average monthly rainfall figures for the Island for the sixteen-month period, December 1951 to March 1953, when compared with the average figures for the previous two fifty-year averages, show that the rainfall was below average in respect of total quantity. In regard to five months of this period, the rainfall was, however, above the average in either of the two fifty-year periods. Largely owing to decreased rainfall there was a drop of over seven thousand tons in sugar production as compared with the previous year.

II. AGRICULTURAL CROPS

A. SUGAR CANE

(a) Production

The yield of sugar cane reaped during 1953 was the equivalent of 160,751 tons sugar. This was made up of 150,499 tons Vacuum pan sugars, 512 tons

Muscovado sugar, and 3,214,292 wine gallons Fancy Molasses, which equated on the basis of 330 wine gallons of Fancy Molasses to the ton of sugar, is the equivalent of 9,740 tons sugar.

The sugar production in Barbados for the past six years is set out in Table II.

TABLE II
Sugar Production for the Period 1948-53

	1948	1949	1950	1951	1952	1953
Vacuum Pan Sugar	56,496	133,868	141,706	163,313	156,216	150,499
Muscovado Sugar	1,262	1,991	1,276	1,253	525	512
Fancy Molasses	20,468	16,872	15,201	23,077	11, 134	9,740
	78,226	152,731	158,183	187,643	167,875	160,751

(b) Export of Sugar and Local Consumption

The Colony's entire exportable surplus of sugar was purchased by the Ministry of Food. The export of sugar is still regulated by the Sugar Production and Export Control Board of which the Director of Agriculture is Chairman. Care is exercised to ensure that the requirements of the local market are provided for.

The position with regard to local consumption and export during the period September 1952 to August 1953 is as follows:—

Estimated stocks in hand at 1st September, 1952:—

					Tons	Tons
Fancy molasses for export	....	....	....	....	9,612	
Sugar for export	....	....	....	....	14,401	
Sugar in wholesalers' hands	....	....	....	....	7,277	31,290
Production during 1953	....	....	....	....		160,751
						192,041

Estimated stocks in hand at 1st September, 1953:—

Fancy molasses for export	....	....	....	....	5,154	
Sugar for export	....	....	....	....	32,060	
Sugar in wholesalers' hands	....	....	....	....	3,569	40,723
						151,318

Total exports as per Customs returns, for the period:—

Fancy molasses	....	....	....	....	13,547	
Sugar	....	....	....	....	122,155	135,702

Difference representing Sugar delivered —

(i) to merchants for local consumption; and						
(ii) to vessels for export but not yet cleared by the Customs Department	....	....	....	....		15,616

By the end of December, 1953, all of the sugar for export had been exported.

(c) Fancy Molasses.

The Barbados Fancy Molasses industry continues to be under the control of the Fancy Molasses Control and Marketing Board of which the Director of Agriculture is Chairman.

At the end of December, 1952, 4,932 tons equivalent to 1,627,560 wine gallons of the 1952 Fancy Molasses crop remained to be shipped. The Fancy Molasses Control and Marketing Board allocated some 9,740 tons equivalent to 3,214,200 wine gallons for production during 1953 for export. The full quantity was manufactured by the small fancy molasses plants.

The quantity of fancy molasses which the importing markets required out of the 1954 crop production was 14,241 tons equivalent to 4,129,890 wine gallons. The fact that market requirements show some increase may be partly attributable to the introduction of bulk shipment of the product which was permitted in full to Canada towards the end of 1953.

(d) The Special Funds for the Benefit of the Sugar Industry and the Welfare of the Workers.

As was done since the 1947 crop sugars purchased by the Ministry of Food, a sum of £2. 15s. per ton was included in the price for 1953 crop sugars. During this year as in the previous year, the Domestic Sugar Agreement provided for the collection of an additional levy of \$1.80 (7s. 6d.) and the total sum of \$15.00 (£3. 2s. 6d.) has been paid into the following funds at the rates shown:—

Sugar Industry Rehabilitation Reserve Fund ....	....	20/- per ton.
Sugar Industry Price Stabilization Reserve Fund ....	....	20/- per ton.
Labour Welfare Fund ....	....	22/6 per ton.

The Sugar Industry Rehabilitation Reserve Fund continues to be administered by the Sugar Industry Capital Rehabilitation Reserve Board, of which the Director of Agriculture is Chairman. The major portion of the funds collected has been paid out in accordance with Regulations made under the principal Act.

The Sugar Industry Price Stabilization Reserve Fund is administered by the Sugar Industry Price Stabilization Reserve Board of which the Director of Agriculture is Chairman. The amounts accruing to this fund have been deposited with the local banks and are earning interest. The purpose of this fund is to mitigate the adverse effect of a reduction in the price of sugar.

The Labour Welfare Fund is administered by the Governor-in-Executive Committee.

The Sugar Industry (Rehabilitation, Price Stabilization and Labour Welfare) (Local Consumption) (Amendment) Act, 1953, was enacted to provide that so much of the levy as is imposed on sugar manufactured in 1953 which is sold for consumption in the Island, shall be paid to the Governor-in-Executive Committee, instead of to the above funds, for the purpose of stabilising the price of certain classes of sugar only, if the Governor-in-Executive Committee thinks this expedient.

(e) Acreage under Cane.

Under the Sugar Cane Census Act, 1937-31, it is compulsory for all landholders with more than ten acres of land to make a return to the Department

of Agriculture showing the acres of cane, and the various varieties to be reaped during the ensuing crop season.

The results of the census for the 1954 crop is presented in Table III together with the corresponding figures for the years 1945 to 1954 inclusive.

As a result of the recent surveys the acreage of cane grown by small-holders is estimated at 10,000 acres.

TABLE III.
Acreage of Sugar Cane reaped in the years 1945-54

Year	ACREAGES							Small Holders (estimated).	Total
	Plantations								
	Plant Canes	First Ratoons	Second Ratoons	Third Ratoons	Fourth Ratoons	Fifth Ratoons	Sixth, Seventh, Eighth & Eleventh Ratoons		
1945	14,551.53	9,744.58	4,756.20	865.70	52.02	1.34	—	7,000	36,971.37
1946	14,056.25	11,614.50	5,578.25	1,817.50	51.25	6.00	—	7,000	40,123.75
1947	13,365.25	11,569.00	6,501.00	1,771.50	257.25	2.25	—	7,000	40,466.25
1948	13,480.75	10,614.09	6,281.00	2,126.75	255.50	28.00	—	7,000	39,786.00
1949	13,869.56	10,911.46	5,249.99	2,090.72	370.49	33.00	—	7,000	39,705.22
1950	13,435.78	11,785.71	6,350.76	2,147.50	415.25	53.00	17.25	7,000	41,241.25
1951	12,555.14	11,833.17	7,137.28	2,869.35	558.28	52.00	15.50	8,000	43,020.72
1952	11,531.99	11,519.78	8,344.59	3,813.25	946.27	59.75	24.00	8,500	44,739.63
1953	10,454.10	10,880.16	8,680.89	4,593.29	1,220.26	131.25	22.50	10,000	45,982.45
1954	10,722.22	10,159.25	8,430.18	4,890.81	1,725.70	293.00	32.00	10,000	46,253.16

(f) Variety Acreages.

These were obtained from plantation returns of the variety acreages to be reaped each year. The variety percentages for all crops for the years 1945 to 1954 are presented in Table IV.

TABLE IV.
Percentages of Acreages of Sugar Cane Varieties recommended by the Department and other varieties reaped during the period 1945-54.
Percentages of Totals

Varieties	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954
B.2935	1.94	0.68	0.26	0.23	0.09	0.54	—	—	—	—
B.H.10(12)	4.76	3.19	2.49	1.36	0.33	0.09	—	—	—	—
B.726	2.95	2.02	1.26	0.70	0.15	0.03	—	—	—	—
Mixed & other varieties	4.83	2.55	1.25	0.52	0.39	0.47	2.08	1.16	1.78	2.14
B.3439	4.89	2.40	0.54	0.25	0.12	0.06	—	—	—	—
B.37161	62.65	74.52	83.83	90.00	92.76	90.80	84.76	80.06	76.04	73.13
B.35187	10.19	6.09	3.25	1.91	0.98	0.53	—	—	—	—
B.34104	7.46	6.89	3.83	1.24	0.32	0.12	—	—	—	—
B.4098	0.33	1.56	3.00	3.43	4.14	4.93	5.82	6.87	7.39	7.70
B.41227	—	0.06	0.08	0.06	0.14	0.49	0.76	0.89	1.01	1.22
B.41211	—	0.04	0.21	0.30	0.58	2.44	6.58	9.74	12.54	12.60
B.43391	—	—	—	—	—	—	0.73	1.28	1.24	1.03
B.45151	—	—	—	—	—	—	—	—	—	.22
B.4744	—	—	—	—	—	—	—	—	—	1.24
B.47419	—	—	—	—	—	—	—	—	—	.72

It will be seen from the above Table that of the total acreage reaped by plantations in 1954, B.37161 occupied 73.13 per cent., a decrease of 2.91 per cent., as compared with 1953. The acreages under B.4098, B.41211 and B.41227 remained practically the same as in 1953. B.45151, B.4744 and B.47419 occupied 0.22, 1.24 and 0.72 per cent. respectively.

(g) Brief review of Sugar Production in the Island during the period 1850 to 1954.

Five-year averages of annual sugar production and of rainfall totals (for 16-month periods of each consecutive sugar crop) are recorded in the diagram on page for the period 1850 to 1954.

It will be observed that production has increased from an average of about 50,000 tons or less during the first five-year period to over 170,000 tons in the last five-year period.

There are several factors which influence the quantity of sugar produced, the more important of these being:—

- (i) total acreage under sugar cane;
- (ii) rainfall;
- (iii) factory efficiency;
- (iv) sugar cane variety;
- (v) cultural methods; and
- (vi) pests and diseases.

There has been no appreciable increase in the total acreage planted to sugar cane, and in view of the encroachment of building sites on arable land the total area now planted may well be a little less than that available in the first half of the period. In regard to the other factors, the most important is rainfall; for example, the average rainfall for the period December 1946 to March 1948 was 51.71 inches and the crop reaped in 1948 was only 78,226 tons, whereas the average rainfall for the corresponding period in respect of the crop reaped in 1951 was 103.26 inches and the size of the crop was 187,643 tons. It is not possible to measure the exact influence of each of the remaining factors, but it is considered that improved factory efficiency and higher yielding cane varieties are largely responsible for the increased production, while cultural operations and pest and disease control make a small contribution. It is believed, however, that in recent years, the cultural methods have made a greater contribution through better tillage resulting from the use of heavy tractors. (The subject of "Sugar Production in Barbados during the past 100 years" was dealt with by Sir John Saint in his Presidential Address to the Eighth Congress of the International Society of Sugar Cane Technologists held in Barbados in 1953).

PART III

SECTION I

PEASANT AGRICULTURE

By

C. A. E. BECKLES

Ag. Senior Peasant Agricultural Instructor

A. General Conditions during the Year

The Weather. Relatively dry conditions in April and May retarded the development of the young cane crop. Heavy rains in October and November while favourable to cane and heavy root crops, adversely affected green vegetables which form an important part of the economy of a large majority of small-holders. On the whole, however, weather conditions during the year were reasonably good for peasant agriculture.

The Main Food Crops. Good rains during the latter half of 1953 resulted in satisfactory yields of the main food crops, yams, sweet potatoes, eddoes, cassava and Indian corn. During November, 1953, sweet potatoes were so plentiful in some areas that they were sold below the controlled maximum price. Generally, yields of all the main food crops were better than in the previous year, and supplies more evenly distributed.

Sugar Cane. The sugar cane crop suffered an initial set-back owing to dry conditions, especially in April and May, 1953. Good, well distributed showers during the rainy season resulted in satisfactory recovery, and a relatively good crop was reaped on small-holdings in 1954. Compared with the previous year, there was a slight closing of the gap between the average yield per acre for estates and small cultivators, 11.62 tons in 1953 as compared with 11.36 in 1954. Some factors which cannot be overcome, such as the necessity to cultivate marginal land, tend to depress yields on small-holdings in comparison with larger units. However, appreciable improvement could be achieved by better methods of cultivation and manuring and less ratooning and by taking advantage of the more intimate attention which is possible on a small as compared with a large unit. The problem is mainly one of economics and is not impossible of solution. The following are some comparative yield data for estate and peasant growers:—

Sugar Cane Delivered to all Factories in 1954.

<i>Estates</i> (tons)	<i>Peasants</i> (tons)	<i>Total</i> (tons)	<i>Peasants' Canes</i> as per cent of <i>Total</i>
1,301,268	245,302	1,546,570	15.86

Average Number of Tons of Cane per Acre Reaped in 1954

			<i>Area</i> (acres)	<i>Yield</i> (tons)	<i>Average Yield</i> per Acre (tons)
<i>Estates</i>	..	..	36,253	1,301,268	35.89
<i>Peasants</i>	..	..	10,000*	245,302	24.53

*estimated

TABLE I

Summary of Sugar Cane Yield Data, 1947—54

Sugar Cane Delivered to all Factories

Year	Total Crop (tons)				Average no. of Tons Per Acre Reaped	
	Estates	Peasants	Total	Peasants as per cent. of total	Estates	Peasants
1947 ..	866,662	122,443	989,105	12.38	25.89	17.49
1948 ..	641,044	77,211	718,255	10.75	19.50	11.03
1949 ..	1,122,072	184,524	1,306,596	14.12	34.31	26.36
1950 ..	1,118,003	198,903	1,316,906	13.04	32.65	28.41
1951 ..	1,402,671	238,806	1,691,477	17.07	40.05	36.01
1952 ..	1,221,701	285,902	1,507,604	18.96	33.71	33.63
1953 ..	1,172,091	209,630	1,381,721	15.17	32.53	20.96
1954 ..	1,301,268	245,302	1,546,570	15.96	35.89	24.52

Estates refer to holdings over ten acres in extent, peasant holdings are those under ten acres in size. Again, the area under peasant canes reaped in 1954 has been estimated at 10,000 acres.

Minor Crops. Among the minor crops grown are cotton, groundnuts, fruits and green vegetables. The growing of cotton and groundnuts on a commercial scale continues to be restricted mainly to areas in the parishes of St. Philip and St. Lucy.

Cotton. There was a slight increase in the area planted to cotton in 1953, as compared with that for 1952. This to some extent could be traced to the need for finding an alternative crop to sugar cane which in some instances did not mature satisfactorily. The crop made satisfactory progress until hampered by heavy rains at time of bolling. Many plots were abandoned before they could be reaped and production generally was low. The exact acreage finally reaped could not be determined but the estimated average yield was only about 250 lb. of seed Cotton per acre.

Groundnuts. Groundnuts cultivation continued to receive the attention of small-holders in St. Philip, St. Lucy and parts of Christ Church and St. Michael. Yields on the whole were moderate and owing to the big local demand supplies were readily disposed of at good prices.

Green Vegetables. Following the glut period for vegetables in February and early March, supplies as usual gradually declined during the following months. They were, nevertheless, more plentiful than they normally are at that time of the year. The months April to July, 1953, were favourable to the production of green vegetables under irrigation, and good crops of lettuce, beans, carrots and beets were maintained. Vegetables planted towards the end of 1953 were adversely affected by the heavy rains of October and November so that the crop at the beginning of 1954 was late. The season, however, was a good one and supplies, especially of tomatoes, cabbage, carrots and beans, were adequate.

Pests and Diseases. One of the most important pests affecting small cultivators during the year was the sugar cane root infesting mealy-bug which did

appreciable damage to fields of ratoon canes. Other pests and diseases included the army worm in sweet potatoes, the pink bollworm in cotton, green leaf hoppers in beans, the cabbage white butterfly and bacterial black rot in cabbage and, especially in the higher rainfall areas, slugs on a wide variety of crops.

Peasant Livestock and Animal Husbandry. During the months immediately following the reaping of the cane crop and before the onset of the rains when green fodder is normally scarce, there is generally a falling off in the condition of peasant livestock. Apart from this phase, livestock on small-holdings maintained reasonably good health and condition during the year. There was a localised outbreak of Newcastle disease in poultry which was limited to a small district in St. Michael and was very soon brought under control. Towards the end of 1953, butchers and speculators began to experience great difficulty in obtaining adequate supplies of pigs for slaughter. In order to meet the increased demand for pigs for fattening which arose, efforts were made to stimulate greater interest in pig breeding.

The price of balanced animal feed dropped from \$8.35 per bag to \$7.85 in June 1953, at which price it remained more or less constant to the end of March 1954.

The Peasants' Loan Bank. The statement in Table II below, submitted by the Manager of the Peasants' Loan Bank, shows that the bank continues to expand its scope of usefulness in providing short and medium-term credit for small-holders. During the year the Peasants' Loan Bank Act was amended, empowering the Bank to make loans to occupiers who were not owners of land.

TABLE II
Statement of Loans made during the Year

	1951-52 (Nos.)	1952-53 (Nos.)	1953-54 (Nos.)
Number of loans granted during the financial year 1st June—31st May	672	719	839
Short term loan accounts opened during the previous financial year (for cultivation, manures, taxes) and still outstanding during current financial year ..	149	83	118
Long term loan accounts opened during the previous financial year (for repayment of Mortgages, Purchase of Livestock and Irrigation) and still outstanding during current financial year ..	347	343	400
	1,168	1,145	1,357
Less extensions of loans included in (1) above	68	15	16
Total number of accounts on books during the financial year	1,100	1,130	1,341
Amount of loans advanced.. .. .	\$56,822.00	\$69,341.00	\$105,834.00

Peasants' Annual Competitions. The usual competitions open to peasants and held in connection with the Annual Agricultural and Industrial Exhibition took place during the year. These were the Peasant Vegetable Garden Competition for which there were 36 entries, the Peasant Holdings Competition 38, and the Cotton Plots Competition for which 7 entries were finally judged. The judges were the Co-operative Officer and the Senior Peasant Agricultural Instructors. The general standard of the entries was good and rivalry, especially in the Vegetable Gardens Competition, was very keen.

B. The Work of the Department's Peasant Agricultural Extension Services

Staff. Mr. W. V. Rose, Deputy Director of Agriculture and officer-in-charge of extension services, arrived at the end of March, 1953, and took up his substantive post in September after acting as Director for 4 months. The Co-operative Officer, who since December 1949 was responsible in the absence of a Deputy Director of Agriculture for co-ordinating the work of the extension services, continued throughout the year to act as Senior Peasant Agricultural Instructor, in addition to carrying out the duties of Co-operative Officer.

Messrs. L. T. Talma, C. D. Spooner and G. A. Ramsay, Peasant Agricultural Instructors, were promoted in July, 1953, to the three additional posts of Senior Peasant Agricultural Instructors which were created the previous year.

In February, 1954, Messrs. L. T. Talma, C. D. Spooner and E. S. Brathwaite proceeded to Trinidad to attend the first one-year course to be held at the Eastern Caribbean Farm Institute which was then being opened. They were replaced on their respective Stations by Messrs. D. A. Corbin, J. E. Wason and E. L. Murray. Messrs. C. L. Bolden, C. T. Grant and G. U. Taylor were appointed to fill the temporary vacancies created on the staff by those changes.

Visits to Peasant Holdings. During the year the Peasant Agricultural Instructors paid 10,832 visits to peasant holdings, as compared with 11,634 in 1952-53. Thus, through the extension staff the close contact maintained between the Department and small-holders was continued. The encouragement and advice given the peasants on these visits to improve their methods of farming is being reflected in the gradual development of better systems of crop and animal husbandry.

School Gardens. Two hundred and eighty-eight (288) visits were paid to school gardens by the extension staff, as compared with 241 the previous year. The heavy rains in October and November, 1953, provided an opportunity for teachers in charge of these school gardens to demonstrate their ability by proper planning and good management to overcome adverse circumstances. It was encouraging to see how well this was done in many instances. Weather conditions during the rest of the period were favourable and, generally speaking, a good standard was maintained.

The Annual School Gardens Competition for which eight cash prizes are awarded, based on the aggregate of marks obtained during the three school terms of the year, took place as usual. Judges were the Co-operative Officer and the Senior Peasant Agricultural Instructors. The system of awarding marks was the same as in the previous year. Competitors were notified, however, that in future two additional heads, namely, (a) soil conservation and (b) accounts and records, would be added as a basis for making the awards.

As usual, the competition was very keen and the prize-winning entries of a high order.

Co-operation. The staff of the Co-operative Section of the Department consisted of the Director of Agriculture as temporary Registrar of Co-operative Societies, the Co-operative Officer who also acted as Senior Peasant Agricultural Instructor, and a part-time audit clerk. Obviously, the amount of propaganda and educational work which could be done to promote and maintain interest in co-operation and stimulate the development of new societies was very small, owing to the limited staff available. Despite this handicap, some work was done, especially in maintaining the enthusiasm of existing societies and assisting in their consolidation and expansion.

The number of registered societies at the end of March, 1954, was 7. These were as follows:—1 savings, 1 consumers, 4 marketing and 1 credit union.

Savings Societies. At the end of the previous financial year on March 31, 1953, there were 2 savings societies registered. In November, 1953, one of these, which was then in operation for a year, was converted into a credit union. The other savings society continued as such throughout the year. The members of this latter society are mainly adolescents, many of whom are either unemployed or under-employed. This has greatly restricted their thrift activities and the general development of the society.

Consumers Societies. The consumers society whose green-grocers shop started in 1952 had failed, functioned for part of the year as a buying club. Little real progress was made, however, owing apparently to the discouraging effect on members of their previous effort.

Marketing Societies. The 4 marketing societies, one of which was registered during the year, engaged principally in the marketing of sugar cane. These societies together marketed 3,790 tons of cane valued at \$60,790 during the 1953 crop as compared with 4,118 tons valued at \$58,101 in 1952. They delivered well over 500 tons of cane each to their respective factories, thereby qualifying for the extra price paid under the terms of the Domestic Sugar Agreement. This extra price in respect of the crop reaped in 1953 amounted to \$658.17, as against \$620.24 in 1952. In addition to its marketing activities, one of these societies continued during the year to purchase fertilisers in bulk for retail distribution to its members. Another handled the transport by motor lorry of its members' canes to the factory.

Thrift and Credit Societies. The credit union which developed out of the former savings society was registered in November 1953. By the end of the financial year on March 31, 1954, this credit union had share capital amounting to \$490.00 and deposits of \$53.00. Loans to members then amounted to \$174.50.

Co-operators' Day. Co-operators' Day was celebrated on Saturday, 16th July, 1953. The celebrations which were presided over by the Deputy Director of Agriculture took place in the parish of Christ Church and were sponsored jointly by the Sayes Court and Fair View Marketing Societies. The main address was delivered by Mr. D. A. M. Haynes, M.B.E., Manager of the Peasants' Loan Bank, and as usual reports on the previous year's activities were presented by the Secretaries of the various societies.

The following is a summary of statistics on registered co-operative societies for the year ending March 31:—

TABLE III.

Year	No. of Societies	Member-ship	Share Capital Savings	Turnover	Gross Profits	Net Profits	Reserve Funds
1952	6	380	\$ 2,865.73	\$ 40,779.32	\$ 533.88	\$ 151.28	\$ 206.33
1953	7	413	\$ 3,537.41	\$ 40,377.92	\$ 1,020.63	\$ 364.30	\$ 652.12

Youth Work. The Leeward Young Farmers' Club which was organised in 1949 continued to function under the supervision of Mr. G. A. Ramsay who has shown special aptitude for this type of work. Owing to lack of adequate staff to organise these groups and deal with the peculiar problems they involve, it has not been possible to make further progress in developing this important branch of work.

Soil Conservation and Cultivation. The peasant agricultural extension staff supervised and assisted in the laying out of 36 soil conservation projects on peasant holdings and school gardens, as against 12 in 1952-53. The total area involved, estimated at approximately 90 acres, was not very large, but it included a large number of intensively cultivated vegetable gardens and fields in the hilly parishes of St. Joseph and St. John where the problem of soil erosion is acute.

C. The District Agricultural Stations

The policy with regard to the six District Agricultural Stations was essentially the same as last year. The peasant investigational units at "Sayes Court" (Christ Church) and "The Home" (St. Philip) were continued. Inadequate supplies of water for irrigation for the greater part of the year continued to be a limiting factor at "The Home". This was to some extent overcome when a bigger and more efficient pump was installed in November 1953. Work on the vegetable garden *cum* livestock unit at "Sayes Court" is proceeding. The 1½-acre unirrigated mixed farming unit at "Jerusalem" (St. Peter) was abandoned during the year owing to the high cost of maintenance.

On the commercial side, the emphasis continued to be on demonstrating efficient mixed farming systems based on sugar cane as the main cash crop. At the same time the Stations continued to function as stud centres and to provide young pigs for sale, mainly for breeding.

The Stud Centres. Owing to the high incidence of venereal diseases in cattle it was decided to remove all bulls from the District Stations. Artificial inseminations which were gradually introduced since 1952-53 with semen supplied three times a week from the Central Livestock Station had completely replaced natural services by January 1954. Owing to the reluctance of some livestock keepers to change to the new system, there was a decline in the number of cows, brought to the Stations for service, as compared with those of the previous year.

The total number of services of all kinds at the six District Stations for the year was 3,587 as against 4,785 in 1952-53. Service fees remained as follows: bulls (mainly artificial inseminations) 72 cents; bucks and rams 18 cents and boars 48 cents.

TABLE IV

Number of Sires standing at Stud Centres at March 31, 1954.

Station	Buck Goats	Ram Sheep	Boars	Total
The Home	2	—	2	4
Sayes Court	2	1	2	5
Groves	3	3	2	8
Jerusalem	3	2	1	6
Haggatts	2	2	1	5
Bullen	2	1	1	4
Total	14	9	9	32

As in the past, the stud animals comprised Grade Guernsey and Holstein bulls, British Alpine and Saanen buck goats, Black belly and Wiltshire Horn ram sheep and Berkshire and Large Black boars.

TABLE V

Number of Services paid for during the Year ending March 31, 1954.

Station	Bulls (Artificial Inseminations)	Buck Goats	Ram Sheep	Boars	Total
The Home	126	165	—	198	489
Sayes Court	70	130	59	129	398
Groves	371	296	384	266	1,317
Jerusalem	116	271	70	80	537
Haggatts	79	178	164	18	439
Bullen	51	209	58	89	407
Total	813	1,249	745	780	3,587

The Financial Returns of Stud Centres. As expected, there was a drop in expenditure on stud animals, as compared with the previous year. This resulted mainly from the removal of the bulls from the Stations on the introduction of artificial inseminations. At the same time, as there were about 1,200 fewer services paid for than in 1952-53 and service fees were maintained at the same level revenue was also reduced. Added to this, there was an appreciable reduction in non-cash revenue from such sources as pen manure as a result of the absence of bulls. The stud service, costings for which were given in the last annual report, continues therefore to be very heavily subsidised.

Breeding Sows. The demand for young pigs was as usual far in excess of what the Stations were able to supply. One of the aims of the Stations' stud centres is, of course, to grade up peasant stock and eventually increase the efficiency of livestock production of the Island. As far as pigs are concerned, in addition to providing the services of good sires, the Department also produces young pigs for sale for breeding purposes with a view to making available a nucleus from which an improved type of animal can be built up. Unfortunately, few small-holders show any sustained interest in pig breeding, with the result that the supply of pigs for fattening frequently falls short of the demand. This shortage was very pronounced during the latter half of the year.

The Stations as a Whole. The principal activities carried out on the District Stations, then, were the same as indicated in the Annual Report for 1951-52. These may be classified as follows:—

(a) *Demonstration or Commercial.*

This includes the demonstration of a mixed farming system with sugar cane as the main cash crop, intensive vegetable garden cultivation, the management of a small banana plot and at two of the Stations, namely, "Sayes Court" and "The Home", the running of a small dairy unit.

(b) *Investigational or experimental.*

This concerns mainly the peasant investigational units at "Sayes Court" and "The Home", which are referred to above.

(c) *Subsidised activities.*

These comprise the stud services and breeding sows. In addition, at some of the Stations where milk was available but could not be disposed of economically, heifers were reared on a subsidised basis.

(d) *Capital Works.*

Included under this head are extensions or major repairs to buildings, roads, etc. During the year work was begun on repairing and paving the yards and main roadways of the Stations.

Financial Statement for the Stations as a Whole. This is given in summary below and takes into account cash revenue and expenditure for each Station in connection with the activities noted above.

**Statement of Cash Revenue and Expenditure for the Year 1st July, 1953
to 30th June, 1954**

Item	The Home	Sayes Court	Groves	Jeru- salem	Hag- gatts	Bullen	Total 1953-54	Total 1952-53
	\$	\$	\$	\$	\$	\$	\$	\$
Expendi- ture ..	8,287.27	7,474.11	6,577.08	7,174.67	9,667.08	5,777.25	44,957.46	54,803.23
Revenue ..	6,155.41	5,263.15	4,622.75	2,120.55	2,819.06	1,992.26	22,973.18	22,657.18
Difference	2,131.86	2,210.96	1,954.33	5,054.12	6,848.02	3,784.99	21,984.28	32,146.05

In previous years a considerable amount of the expenditure on the Stations was incurred in subsidising the stud animals, particularly the bulls. The substantial drop in expenditure for 1953-54, as compared with that for the previous year, was due mainly to the removal of the bulls, consequent on the introduction of artificial inseminations. In spite of the loss in revenue resulting from the reduction by 1,200 in the number of stud services paid for in 1953-54, compared with those paid for in 1952-53, the total revenue for all Stations for the year was more than \$300 higher than that for the previous year.

The increase in revenue resulted mainly from improved irrigation facilities at some of the Stations, and better returns from the demonstration or commercial activities. The net result has been a gratifying closing of the gap between total expenditure and total revenue. The District Stations, nevertheless, are still a long way from being self-supporting and in fact are not expected to be, except in so far as the demonstration or commercial activities are concerned.

SECTION II.

SUGAR CANE BREEDING AND SEEDLING TESTING

BY

B. DEL. INNISS

Botanist, B.W.I. Central Sugar Cane Breeding Station.

Sugar Cane Breeding—B.55' and B.56' Series.

Sugar cane breeding was carried out at Groves Agricultural Station from October 1953 to January 1954. Flowering was free, and all available lanterns were in use, some of them being used twice. One Mauritius-type lantern and three lanterns of a similar type covered with plastic were also used with promising results. One hundred and eighteen crosses were made, as well as twenty-one selfs and sib-crosses for the cytogenetics research programme. Seed from twenty-four crosses were sent to Jamaica, and from thirty-two crosses to British Guiana. It is estimated that nearly 91,000 seedlings germinated. Twenty-four thousand, nine hundred and ninety-six (24,996) were potted singly and approximately 45,000 were potted in bunches of 5 — 7 per pot. Thirteen thousand, eight hundred and thirty-seven (13,837) singles were planted out in the Field Nursery as well as 7,030 bunches. In addition, 2,000 seedlings were planted from pots into the B.55' Series Short Season First Year Seedling Trial.

Details of the crosses made and seedlings raised, potted and planted out, are available in the Annual Report of the B.W.I. Central Sugar Cane Breeding Station.

Reaping the First Year Seedling Trials—B.54' Series.

Two hundred and ninety seedlings were selected from the First Year Seedling Trial of the B.54' Series, details of which are tabulated in the abovementioned Annual Report. These seedlings were planted in multiplication plots at Codrington Experimental Station.

Seedlings of the B.53' Series.

The seedlings of this series were multiplied at Codrington and subjected to further selection, when their number was reduced to two hundred and thirty. These have been planted in Second Year Seedling Trials at the low rainfall station, Codrington (2 trials) and in duplicate trials at the high rainfall stations, Guinea and Henley.

Seedlings of the B.52' Series.

The seedlings of this series were cut as plant canes in the Second Year Seedling Trials during the past crop season at the low rainfall station, Codrington (2 trials) and in duplicate trials at the high rainfall stations, Fisherpond and Clifton Hall. Twenty-eight selections were made, of which two are for the breeding plots only. The most promising will be tested further in Barbados, and in October, Colonies which contribute to the funds of the Station will receive selected consignments. Particulars of the performances of the selected seedlings are given in the Annual Report of the Station.

Seedlings of the B.51' Series.

These were cut as ratoons in the Second Year Seedling Trials at Hothersal and Todds during the past crop season. Selected seedlings of this series were planted in Third Year Seedling Trials in November, 1953.

Seedlings of the B.50' Series.

These were cut as plant canes in Third Year Seedling Trials during the past crop season. One seedling of the B.49' Series which was selected as a ratoon was planted in these trials along with the seedlings of the B.50' Series. Generally speaking, the standard variety, B.4744, gave the heaviest yield of plant cane, and had a good quality juice of high purity. The only other seedling which performed consistently well was B.49119. This variety also has a good juice of high purity. Its main faults are that the canes are relatively thin, and it tends to flower profusely as a plant cane, particularly in the high rainfall areas. As it was selected on a basis of its ratoon performance, the ratoon results of these trials are being awaited with interest. Many of the varieties of the B.50' Series outyielded the standard variety, B.37161, in one or more trials but, for one reason or another, they cannot be considered promising at present.

Seedlings of the B.49' Series.

In these trials the standard varieties gave exceptionally good results. In the low rainfall areas B.41211 was outstanding. In the intermediate rainfall areas B.4744 gave the heaviest yields of ratoon cane, while in the high rainfall areas B.4744 was in a class by itself. B.49311 gave fairly good yields of ratoon cane in the high rainfall areas and on the valley soils, and has an excellent juice. However, it cannot compete with B.4744 under these conditions.

Seedlings of the B.48' Series.

None of the seedlings of this series was considered to be worthy of further trial, and no second ratoon trials were cut.

Seedlings of the B.47' and Earlier Series.

Two Third Year Seedling third ratoon trials were cut: one in the intermediate rainfall area and one in the high rainfall area. In the intermediate rainfall area, B.4738 was outstanding as a ratoon. It has a good juice of high purity and may become a commercial variety in the low and intermediate rainfall areas, where arrowing is not a limiting factor. The performance of B.47258 was also impressive. Cane yields of this variety throughout these trials have been good without being spectacular, while the juice quality has been exceptional. B.47258 is being put into Select Seedling Trials. With its excellent juice and freedom from arrowing, it may find a place in commercial cultivation. B.4744 and B.47419 gave ratoon yields comparable with those given by the standard varieties, B.37161 and B.4098, and both had very good juices.

In the trial in the high rainfall area, the field was attacked by mealy bug and yields were consequently not as heavy as was expected. B.4744 gave the heaviest yield of cane, followed by B.4738, B.47204 and B.47314. Here again, B. 47258 gave a good yield of ratoon cane of very good juice quality.

In Select Seedling Plant Cane Trials, B.4744, B.47419 and B.4738 all outyielded B.37161 in the low rainfall areas, but not by significant quantities of cane or sugar.

In the intermediate rainfall areas, B.4744 significantly outyielded all other varieties on cane and sugar. B.4738 was not outstanding as a plant cane in this area, and arrowed very heavily.

On the valley soils, B.4744 again significantly outyielded all other varieties in tonnage of cane, but differences between mean sugar yields were not significant.

In the high rainfall areas, B.4744 outyielded all other varieties, but in one case was not significantly better than B.47419.

In the Select Seedling Ratoon Trials, B.41211 gave the heaviest yield of ratoon cane and sugar in the low rainfall area, but was not significantly better than any of the other varieties.

In the intermediate rainfall area and on valley soils, B.41211 gave the heaviest yield of ratoon cane and sugar, but was not significantly better than B.4744 and B.47419.

In the high rainfall area, B.4744 gave the heaviest yields of ratoon cane, but was beaten on ratoon sugar by B.45151 though neither of these differences was significant.

B. 45151 has performed exceptionally well on valley soils and also on the red soils of the high rainfall area. Its excellent juice and powerful ratooning should make it a useful commercial variety in these areas. Its main drawback appears to be the size of the individual canes, which are relatively thin.

Details of the trials are available in the Annual Report of the B.W.I. Central Sugar Cane Breeding Station.

Ratoon Stunting Disease

In August, 1953, Mr. Steindl, pathologist of the Bureau of Sugar Experiment Stations, Queensland, visited the Island during a tour of the British West Indies sugar areas, made at the invitation of the B.W.I. Sugar Association, with the object of ascertaining whether Ratoon Stunting Disease was present. Mr. Steindl found internal symptoms similar to those normally associated with this disease, and suggested that planting material of the various varieties should be treated as a control measure, and nurseries of disease-free cane established. He recommended that planting material should be treated in a hot air oven at a temperature of 54 °C. for eight hours. Two ovens capable of carrying out this treatment were ordered, but did not arrive until the middle of January. In the meantime, news was received from Australia to the effect that hot water treatment at 50 °C. for two hours had been found to be most effective. An oil drum was accordingly fitted with simmerstat-controlled electric heating elements and a revolving basket fitted with vanes, which would keep the water in circulation. Planting material of various varieties was treated by this means and nurseries planted. A trial was laid down at Codrington to compare the performance of treated and untreated cuttings and to observe whether the symptoms of the disease do appear in the plots grown from un-

treated cuttings and, if so, to measure any reduction in yield caused by the disease. Germination of treated plants was not very good, so that the stand in the trial as well as in the nurseries was very patchy and required a great deal of supplying. Further, some varieties did not appear to stand the treatment as well as others, and it has not been possible to establish these in the quantities desired. However, the planting material which will be available this year should be of sufficient quantity that by 1956 or 1957, at the latest, all cane planted in the Island should be from treated planting material.

SECTION III

BOTANY

Ornamental plants were propagated and distributed as usual. The number of plants distributed is given in Table I.

TABLE I.

Year	Number of plants distributed
1952-53	5,528
1953-54	10,970

Distribution of vegetable seed from the Department's Office

This distribution aims at encouraging the purchase of vegetable varieties which are known to be suited to local conditions. The Department purchases these seeds from reliable firms and sells them in small quantities at cost. The quantities distributed are given in Table II.

TABLE II.

Seed	Variety	Amount — lb.	
		1952-53	1953-54
Beans	Bountiful	12,779	11,776
"	Kentucky Wonder	155	167
" , Lima	Fordhook	95	105½
"	Ideal	91	90½
"	Early Giant	10	10
"	Tender Green	—	10
"	Top Crop	209½	980½
"	Green Pod	20	—
Beet	Detroit Dark Red	194	177½
"	Early Blood Turnip	79½	95½
"	Early Egyptian	64½	74½
"	Lutz Green-leaf	10	—
Cabbage	Hastings Sure Crop	9	13½
"	Danish Ball-head	15	17½
"	Late Flat Dutch	10	13
"	Wakefield Charleston	29½	19
"	Early Jersey Wakefield	24½	21½
Cabbage	Resistant Golden Acre	24	22
"	Succession	9½	23½
Cantaloupe	P.M.R. No. 45	1½	1
"	Hales Best No. 36	—	½
Carrot	Chantenay	95½	112½
"	Danvers	214½	211
"	Oxheart	300½	241½
Cauliflower	Sutton's Early Patna	10½	9½
Cucumber	A & C	7	14½
"	Cool and Crisp	5½	½
Egg Plant	Black Beauty	2	2½
Kohl Rabi	Extra Early White Vienna	4	3½
Lettuce	Mignonette	83	105
"	Black Seeded Simpson	—	7½
"	Bibb	11	½

TABLE II—(Continued)

Seed	Variety	Amount — lb.	
		1952-53	1953-54
Okra	Dwarf Prolific	23	12 $\frac{3}{4}$
Onion	Southport Red Globe	4 $\frac{1}{2}$	1
"	Red Bermuda	2 $\frac{1}{2}$	1
"	Red Selection No. 64	—	$\frac{1}{2}$
Parsley	Emerald	20 $\frac{1}{2}$	21
"	Moss Curled	—	5
Pepper	Ruby King	1 $\frac{1}{2}$	1 $\frac{1}{2}$
"	Early Wonder	1 $\frac{1}{2}$	$\frac{1}{2}$
"	California Wonder	—	$\frac{1}{4}$
Radish	Scarlet Globe	13	12 $\frac{1}{2}$
Squash	White Bush-Scalloped	10 $\frac{1}{2}$	6 $\frac{1}{2}$
Swiss Chard	Lucullus	3 $\frac{1}{2}$	3 $\frac{3}{4}$
Tomato	Bounty	25	45
"	Marglobe	36 $\frac{1}{2}$	27 $\frac{1}{2}$
"	Bonny Best	25	5
Turnip	Purple Top White Globe	3 $\frac{1}{2}$	3
		14,732 $\frac{1}{2}$	14,474

(a) *Citrus*. Twelve hundred and ninety-nine budded citrus plants were distributed at a price of twelve cents each to peasants and two shillings each to others.

(b) *Dwarf Coconuts*. Two thousand, four hundred and one dwarf coconuts were imported from St. Lucia and sold for planting purposes.

TABLE III

Species	Varieties	Total Number of Plants delivered	
		1952-53	1953-54
<i>Citrus:</i>			
Citron ..	Trinidad	19	7
Grapefruit ..	Foster, Duncan, Marsh, Walters, Claybury Nos. 1 & 2	283	275
Lemon	Claybury, Frere Pilgrim	44	23
Lime	Dover, Claybury, Lisbon	580	452
Mandarin ..	Dancy, Claybury, Nos. 1, 2 & 3	70	105
Orange	Tardiff, Parson Brown, Navel, Ruby, Pineapple, Claybury, Nos. 1, 2 & 3, Bernardo, King, Valencia	462	350
Shaddock ..	Kinch, Claybury Nos. 1 & 2	51	63
Pomelo	Codrington	36	24
Avocado Pear ..	Selected seedlings	1,545 272	1,299 110
<i>Miscellaneous:</i>			
Breadfruit ..		63	72
Breadnut ..		2	2
B'dos Cherry ..		25	31
Fig		6	5
Guava		91	52
Grape		17	8

TABLE III —(Continued)

Species	Varieties	Total Number of Plants Delivered	
		1952-53	1953-54
Miscellaneous (Cont'd)			
Golden Apple		37	17
Genip ..		—	4
Mango (Stock)		47	23
Pawpaw ..		21	30
Sugar Apple		22	11
Soursop ..		15	3
Water Lemon		3	4
Dwarf			
Coconuts ..	Hatched Nuts	4,957	2,401
		7,123	4,072

Afforestation

Distribution of Trees. Forty-eight thousand, three hundred and thirty one casuarina trees were distributed, being an increase of over thirty-two thousand and distributed during the previous year.

SECTION IV.

IRRIGATION

By

A. D. HERBERT,
Irrigation Officer.

1. Small Holdings.

During 1953-54, the operation of the Peasant Irrigation Assistance Fund was continued on a somewhat reduced scale, as there were fewer applications for assistance.

The Irrigation Officer paid 35 visits to peasant holdings in connection with irrigation. Advice and assistance were given whenever it was requested.

It is considered that grouping of peasant holdings for irrigation purposes would reduce the present prohibitive cost, to the individual, of irrigation equipment. Attempts are being made to get peasants in suitable areas to form "Irrigation Co-operatives."

2. Plantations.

The owners of 6 plantations requested assistance. Visits were paid and advice given in connection with the improvement of existing irrigation systems and the design of new systems.

3. Agricultural Stations.

Irrigation was continued on the six stations and new equipment was installed on another.

Periodic visits were paid by trained mechanics for the purpose of maintaining and repairing the pumping plants.

- (a) *Codrington.* The old Aermotor was removed as it was no longer serving any useful purpose.

The electric submersible pump continued to give trouble-free service.

The small booster pump, which is in daily use, required repair on two occasions.

The large booster pump, which is not used, was removed so that it could be put in working order.

The oscillators in the Cane Breeding Station's cisterns continued to give trouble due to lime deposits. Australian "roses" were installed to replace some of the spray lines.

- (b) *Central Livestock Station.* Fodder production was maintained by means of the original irrigation system. This was also used to irrigate a limited area under sugar cane, and to supply water for the experimental plots in Middle Eleven Acre field.

The engine room was altered and repaired.

With funds provided by the Irrigation Board a new and larger pumping plant and irrigation system was installed at the Pine Plantation. The system is designed to irrigate 60 acres of sugar cane land on a commercial basis.

(c) *The Home*. The diesel alternator and submersible pump arrived and were installed late in 1953. It was necessary, first, to remove the existing pumps and to deepen the well. The new plant is working satisfactorily.

(d) *Sayes Court*. High salinity of the water continues to cause damage to the pumping plant. Frequent repairs were necessary.

(e) *Jerusalem*. Irrigation was continued with water supplied by the Waterworks Department. 1953 was the first year, since the introduction of irrigation to this station, that it was possible to apply an adequate volume of water to the fields. This resulted in the production of the highest yield of cane per acre since the station was started.

(f) *Groves*. The Waterworks Department agreed to supply a limited volume of water, in periods of drought, for the Cane Breeding Station's plots. The necessary pipes and fittings were installed.

4. The Water Control Board

The Board held two meetings during the year. A Clerk-Typist was appointed, on secondment, from the Post Office. Temporary inspectors were appointed for a period of two months.

The registration of 902 wells was carried out during July and August, 1953. After this period inspectors were sent over the Island to search for and check all wells. Many unlicensed wells were found and the owners were called upon to obtain licences.

A large number of applications have been received for permission to abstract water from wells.

5. The Irrigation Board

This Board held nine meetings during the year, and accomplished a considerable amount of work. The time of the Irrigation Officer, during 1953-54, has been mainly taken up with putting into effect the decisions of this Board.

The Board decided, in 1953, to install large scale irrigation system at three plantations for investigational purposes. After some deliberation and exploration, the Pine Plantation, St. Michael, Sandy Hill Plantation, St. Philip, and the Hope Plantation, St. Lucy, were selected as suitable sites. An existing well at the Pine was deepened and adits were dug. A new well and adits were dug at Sandy Hill. The existing well at the Hope was deepened and adits dug. An existing well at Friendship was cleaned and deepened.

Buildings were erected at the Pine and at Sandy Hill to accommodate the pumping plant and staff.

Pumping equipment and distribution pipes were installed at the Pine late in March 1954. Staff was employed and irrigation started

Pumping plant, distribution pipes and fittings are on order for Sandy Hill and the Hope.

An electric submersible pump capable of testing wells of various depths and capacities has been imported. It was necessary to import also a diesel alternator set to produce electricity to run this pump. The alternator was mounted, locally, on a chassis and wheels, so that it may be taken wherever it is required. A derrick was constructed for the installation and removal of the pump. A building was erected to house the alternator set and pump when not in use.

Through the co-operation of the Waterworks Department a large drilling rig, with its necessary engines and attachments, was imported. A Land Rover was purchased to move the rig and its labour force from place to place. This rig, which is operated by the Waterworks Department, was erected and tested at Belle during March 1954.

The Waterworks Department kindly loaned the services of their surveyor to survey and prepare plans of the sugar estate lands which are to be irrigated by the Board.

Agreements have been drawn up between the Board and the owners of lands under test.

The Board appointed a sub-committee to advise on work to be carried out on peasant holdings. This committee held several meetings and reported to the Board. As a result, the Board decided to install two large scale irrigation systems on suitable groups of peasant holdings; provided that the peasants concerned would form Irrigation Co-operatives. Surveys of peasant holdings were carried out, plans prepared and meetings of peasants held. Up to the present date no peasant irrigation co-operatives have been formed as only a few peasants appear to be interested in the scheme. Work continues on this project.

SECTION V.

ANALYTICAL AND CHEMICAL

By

N. CARMICHAEL

Government Analyst.

Over the period April 1, 1953 to March 31, 1954, a total of 2,008 samples were analysed for various Government Departments, Business Firms and Private Individuals, showing a decrease of 116 samples with respect to the previous financial year.

The decrease, however, is mainly in respect of Agricultural samples occasioned by the shortage in this Department of an Agricultural Chemist for whom the Government Analyst has had to do part-time work; otherwise there has been an overall increase in the total number of Food & Drugs and non-Agricultural samples examined.

The nature of Agricultural work done is given under Agricultural Analyses.

The source and distribution of samples is supplied in Table I with a comparison over the five year period 1949 to 1954.

TABLE I.

Distribution of Samples over the Period 1949—1954

	1949	1950	1951-52	1952-53	1953-54
Police Department ..	274	348	408	274	362
H.M. Customs ..	126	105	78	74	131
Public Works Department ..	15	—	—	—	—
Agricultural Department ..	491	572	988	1,139	988
Parochial & Sanitary Dept. ..	331	357	330	475	395
Agricultural Society ..	83	28	25	5	6
Other Departments ..	55	38	14	27	29
Private Individuals ..	220	83	83	130	97
Total ..	1,595	1,531	1,926	2,124	2,008

Table II comprises samples examined for the Police Department:—

TABLE II.

Samples Examined for the Police Department.

Sample	No.
Criminological & Forensic	189
Milks	110
Butters & Cooking Oils	27
Rums	17
Tea, Coffee, Cocoa, etc.	12
Feeding Stuffs	6
Waters	1
Total	362

Criminological & Forensic: Exhibits submitted under this head are from the C.I.D. and have to do with problems that arise in connection with the administration of justice.

TABLE III.

Exhibits from The C.I.D.

	Cases	Exhibits
Suspected Poisoning	11	64
Attempted Suicide	1	12
Sudden Deaths	6	10
Throwing of Corrosive Liquids	2	11
Firearms Identification & Classification	8	35
Unlawful Possession of Firearms	1	1
Driving under Influence of Alcohol	2	8
Suspected Arson	7	16
Drug Identification	2	7
Explosives	3	7
Administering Powdered Glass	1	1
Coins & Counterfeiting Exhibits	1	17
Totals	45	189

Sudden Deaths, etc.: The Mount Gay Case in which 4 men died while cleaning out an empty brewer's vat was an almost classical text book case of "Carbon dioxide" poisoning.

Other poisons identified in connection with sudden deaths were: arsenic, strychnine, aconite, and oil of chenopodium.

Two separate cases in connection with driving under the influence of alcohol showed 1.3 and 10 parts per thousand of alcohol in the urine and vomitus respectively.

The two cases dealt with respecting the throwing of corrosive liquids gave positive tests for sulphuric acid in all of the eleven exhibits submitted.

Milk Adulterations: Six out of the 110 samples submitted by the Police Department (Table II) showed adulteration by the addition of water as interpreted by the Food & Drugs Act.

The Customs Department submitted a total of 131 samples for classification. Their distribution is given in Table IV.

TABLE IV.

H. M. Customs.

Sample	No.
Butters & Cooking Oils	5
Tea, Coffee, Cocoa	2
Feeding Stuffs	1
Milks	14
Petroleums	94
Rums, etc.	8
Miscellaneous	7
Total	131

Samples examined in this connection were mainly for the assessment of duty on imported articles.

Food & Drugs: The maintenance of proper standards respecting the sale of milk, food stuffs, etc., was mainly carried out by the Parochial and Sanitary authorities who submitted a total number of 395 samples, 393 of which were milks.

Eighteen out of the 393 samples of milk examined in this respect showed adulteration by the addition of water.

The number of samples examined for private individuals this year was 97 as against a total of 130 for the previous year. Their nature is indicated in Table V.

TABLE V.

Private Individuals

Sample						No.
Butters, Margarine & Cooking Oils	..	..	..	..	..	6
Fertilisers	..	..	..	..	..	23
Feeding Stuffs	..	..	..	..	..	8
Milks	..	..	..	..	..	15
Waters	..	..	..	..	..	13
Petroleums	..	..	..	..	..	4
Bread Loaf	..	..	..	..	..	2
Unclassified	..	..	..	..	..	26
Total	..	..	..	..	..	97

Samples unclassified comprised:— Horse saliva swabs, Fusel oil, Gases for combustibility, quantities of Bagasse Fly ash, Filter press cake and Soap.

AGRICULTURAL ANALYSES

During the year 1953-54, the Government Analyst continued to do part-time work for the Agricultural Chemist. During this period, 988 samples were analysed for the Department of Agriculture and 1,050 for the British West Indian Central Sugar Cane Breeding Station.

Samples analysed for the B.W.I. Central Sugar Cane Breeding Station comprised sample bundles of cane, in connection with manurial and select seedling trials. Returns were made to the Principal Agricultural Assistant showing:—

- (a) megass and juice extracted per 100 lb. of cane ;
- (b) fibre and sucrose content of the residual megass; and
- (c) sucrose and glucose in juice.

Other Laboratory work done for the Department of Agriculture in connection with the post of Agricultural Chemist is summarised in Table VI.

TABLE VI.
Department of Agriculture

Sample						No.
Leaf Analyses	..	..	..	..	..	416
Milks	..	..	..	..	..	448
Feeding Stuffs & Rums	..	..	..	..	..	70
Balance Animal Feed	..	..	..	..	..	15
Well Waters	..	..	..	..	..	15
Infusorial Earth	..	..	..	..	..	4
Rice Sweepings	..	..	..	..	..	1
Soil	..	..	..	..	..	2
Elephant Grass	..	..	..	..	..	4
Miscellaneous	..	..	..	..	..	13
Total	..	..	..	..	..	988

Leaf Analysis consisted of investigational work in connection with N.P.K. values for foliar diagnosis. Difficulties previously experienced with the micro determination of phosphate were ironed out and the search for a reliable method with regard to micro potash determination resulted in the adoption of the colorimetric dipicrylamine method. Our modification gave high accuracy and good reproducibility, (the coefficient of variation of a set of 20 determinations not exceeding two per cent.)

SECTION VI.

ENTOMOLOGY

BY

J. E. CLARKE,

Agricultural Assistant

Entomological work during the period under review was mainly concerned with investigations into the use of soil insecticides for the control of sugar cane root pests.

Infestation of the sugar cane root mealy bug *Neorhizoecus*, associated with the ant *Acropyga marshalli*, increased during the year especially in the higher rainfall districts and became more widespread towards the end of the year. Trials were laid down to test the value of different soil insecticides at varying rates of application as a means of effecting temporary control of the pest.

Routine work was also continued on the maintenance of effective control over sugar cane moth borer *Diatraea saccharalis* and with a general watch over insect pests of food and other crops.

Control of *Diatraea saccharalis* (the small borer of sugar cane).

During the year, a total of 267,830,000 egg parasites of *Trichogramma minutum* was bred in the laboratory and, of this amount, 234,351,400 were made available for field distribution. The detailed incidence of the damage caused by this moth borer was maintained at factory yards on a somewhat reduced scale, on account of extensive work in relation to cane root mealy bug. Forty samples were taken instead of the usual sixty, and the internode infestation averaged 9.1%, which compares favourably, with infestation recorded in former years.

The usual work was also carried out on the monthly average rate of *Diatraea saccharalis* egg deposition and extent of field parasitism by *Trichogramma minutum* at Codrington Experimental Station.

Sugar Cane Root Borer (*Diaprepes abbreviatus*) and Brown Hardback (*Clemora Smithi*)

Investigations into the use of soil insecticides (aldrin and gammexane) for the control of these pests have been continued. No conclusive results are yet available.

Sugar Cane Root Mealy Bug (*Neorhizoecus*) and its Associated Ant (*Acropyga*)

The damage caused by this pest became obvious over a larger area during the year and was most evident in the older fields of ratoon canes. As an interim emergency measure for the control of this pest the chlorinated hydrocarbon "Agroside 20" was recommended for application as a soil insecticide, at the rate of 13 lb. of the gamma isomer per acre, to infested fields of ratoon canes which would normally be grown for two more seasons. It was also recommended that this insecticide should be applied to "preparation" fields in areas where heavy infestation had been observed.

A mixing plant was established and put into operation by this Department at the end of the year to mix the "Agrocide 20" with limestone dust as a diluent.

Food Crops and Garden Crops.

A randomised plot experiment of sweet potatoes and corn was laid down at Codrington Experimental Station for weight and taint test, using 8 lb., 13 lb. and 18 lb. of gamma isomer per acre.

Advisory work including visits and loans of spray machines to combat insect pest of miscellaneous garden and vegetable plants was maintained.

Wood Ant Control.

Public and private demand for the services of the Wood Ant Inspector increased during the year, with the result that cane field inspections were curtailed.

Fumigation

During the year, 1,990 empty copra bags were fumigated for the Barbados Co-operative Cotton Factory; also fumigated for other merchants were 120 bags of scratch grain; 76 bags of poultry feed; and 22 bags of peas.

SECTION VII.

PLANT DISEASES AND COTTON

Mosaic Disease of Sugar Cane.

Twenty-four (24) returns were received in accordance with the Mosaic Disease (Eradication) Act, 1943 (1843-22), and no infected holes were reported.

Cotton.

The Okra and Cotton Close Season was again proclaimed and extended for a period of three months (1st April — 30th June).

Seed was distributed to plant 160 acres, made up as follows:—plantations — 6; peasants — 154. One hundred and six acres were reaped which gave the following yields:—

Seed Cotton	21,445 lb.
Lint	5,470 lb.
Ginning percentage	25.50 %

The average yield was low owing to very little attention being paid to proper cultivation methods, and the early attack of pink bollworm, which forced growers to destroy cotton plots before the reaping of the second crop.

Cotton Selection.

The variety trials A and B, were again carried out at Codrington. Trial A was planted in the following varieties, viz., B.4404, B.4411, B.4413, B.4706, B.4902, B.4905, B.5006, B.5103, B.5104, using B.1 as standard. Trial B was planted using the following varieties, viz., B.1(3), B.5005, B.5101, B.5102, B.5107, B.5202, B.5204, B.5206, B.5207 with B.1 as standard.

Selection of seed for the Progeny Row trials was made from the following varieties, viz., B.1, B.4404, B.4411, B.4706, B.4805, B.4807 and B.4905 from which yields of over 1,000 lb. of seed cotton per acre had been obtained.

Seven strains were selected for further trial.

The average Lint length has been maintained at 60 Mms.

Cotton Pests and Diseases.

For the period under review, the search for "Wild Cotton" trees was continued and 759 trees were found and destroyed. These "Wild Cotton" trees were found in pasture lands, tenantries and gullies.

There was the usual infestation of the leaf defoliating worm, (*Aletia Argillacea*) but it was easily controlled by spraying with lead arsenate or dusting with a mixture of Paris green and slaked lime. The pink bollworm of cotton made its appearance early in the season, causing many of the growers in St. Philip to lose a part of the crop.

Plant Pest and Disease (Importation) Act.

Twenty-nine (29) permits to import planting material were issued under this Act.

Plant Export Certificates.

One hundred and twenty-eight (128) export certificates were issued during the year.

Miscellaneous Inspections of Imported Planting Material.

226 packages of bulks, vegetable & flower garden
seeds and Rose trees —examined & passed

1 crate Coconut plants	..	..	..	—	”	”	”
9,024 Coconut plants	..	..	..	—	”	”	”
5 Mango plants	..	..	..	—	”	”	”
3 Pear plants	..	..	..	—	”	”	”
3 Orchid plants	..	..	..	—	”	”	”
32 packages Orchid plants	..	..	..	—	”	”	”
21 packages Rose trees ..	..	..	..	—	”	”	”
74 Rose trees	..	..	..	—	”	”	”
103 bundles Christmas trees	..	..	..	—	”	”	”
7 packages bulbs	..	..	..	—	”	”	”
13 cases bulbs ..	..	..	..	—	”	”	”
6 Citrus plants	..	..	..	—	”	”	”
19 Anthurium Lily plants	..	..	..	—	”	”	”
13 Miscellaneous plants	..	..	..	—	”	”	”
1 package Soya Beans	..	..	..	—	”	”	”
6 Banana Suckers	..	..	..	—	”	”	”
1 Spice plant	..	..	..	—	”	”	”
1 package Tubers	..	..	..	—	”	”	”
3 packages Mattresses ..	..	..	..	—	”	”	”

In addition to the above, 51 bales of cotton lint imported for the use of the Cotton Spinning Plant were inspected, as well as articles suspected of containing raw cotton. Three (3) shipments of broken rice were also inspected.

SECTION VIII.

ANIMAL HUSBANDRY

By

M. B. PROVERBS

Senior Veterinary Officer.

1. Cattle

The cattle breeding programme was continued and expanded by the use of artificial insemination during the year. All bulls previously used for natural service and found to be infected with Trichomoniasis were slaughtered. Young Friesian and Guernsey Grade bulls which had not been used for natural service and which had been specially selected from the best milk yielders at the Central Livestock Station are being employed for artificial insemination purposes. The process of upgrading of the Island's cattle population with high grade sires of European breeds was continued cautiously and efforts are being made at the same time to improve the general standards of feeding and management. Only six grade bulls were available for use during this period and it was not therefore always possible to supply semen from bulls of both breeds on any given day. Additional grade bulls are, however, being reared and it is proposed to maintain at least 20 bulls for the artificial insemination centre.

Cattle Breeding at the Central Livestock Station.

The cattle breeding policy for the Central Livestock Station, namely, the upgrading of local cattle by breeding to imported pure bred sires of selected European breeds, viz., Friesian and Guernsey, had to be suspended during the period under review, as three of the five pure bred bulls were found to be infected with Trichomoniasis and the other two, which had been used for natural service, were suspected of being infected. It was therefore necessary to use semen from grade bulls on the dairy herd from December 1952 until January 1954.

The Senior Veterinary Officer, while on leave in Britain, selected two pure bred Guernsey bulls and two pure bred Friesian bulls, all about one year old, which had not been used for natural service. The use of these bulls for artificial insemination began in January 1954.

By the end of the year the size of the herd had attained 99 cattle units of which 47 cows were in milk. The total quantity of milk produced was 220,052 lb. as compared with 242,007 lb. in the previous year.

2. Sheep.

The comparison continues between the local Black Belly sheep and the progeny of the cross between the imported Wiltshire Horn sheep and the local Black Belly.

During the year, one pure bred Wiltshire Horn ram was imported from England and the two pure bred ewes at the Central Livestock Station gave birth to two rams and two ewes, respectively.

3. Pigs.

Highly graded and pure bred sows and boars of the Large Black and Berkshire breeds are being maintained at the Central Livestock Station and District Agricultural Stations. The breeding unit of approximately 20 sows has been increased to approximately 50 sows in an effort to meet the increasing demand for good quality pigs for breeding purposes.

Two pure bred Large White in-pig gilts were imported from England during the year with the object of providing a more suitable pig than the Large Black for ham and bacon production.

4. Goats.

Pure bred British Alpine and Saanen bucks and does are being maintained at the Central Livestock Station and District Agricultural Stations. During the year, one British Alpine buck and one British Alpine in-kid doe were imported from England, and one Saanen doe was imported from St. Kitts.

5. Poultry.

The poultry section was expanded to meet an increasing demand for week-old chicks, and a 2112 model Hearson Incubator is now being employed. During the year, 2,434 chicks were sold as compared with 2,335 chicks in the previous year and just over 1,000 in 1951—52.

Annual importations of Kauder White Leghorn and Parmenter Red chicks are being made from the U.S.A. for replacement of breeding stock.

SECTION IX.
ANIMAL HEALTH

By

M. B. PROVERBS,

Senior Veterinary Officer

The Senior Veterinary Officer was absent on leave from the 9th July until 6th December 1953, and during this period the routine veterinary work of the Department was carried out by Dr. P. G. Scoggins, Veterinary Officer.

During the year the general health of Government owned livestock was maintained at a satisfactory level.

Investigations into existing animal and poultry diseases throughout the Island have been continued and the high incidence of sterility in dairy herds and individual cattle continued to receive a great deal of attention.

The Senior Veterinary Officer attended the XXVth International Veterinary Congress in Stockholm and refresher courses at the Ministry of Agriculture Veterinary Laboratory at Weybridge and Burroughs Wellcome Research Institute at Frant while on leave.

Review of Diseases:

1. Mastitis in Dairy Cows:

Clinical mastitis is a serious economic problem in the Colony. The contagious form of mastitis is found to respond well to strict dairy hygiene, early detection and the treatment of infected cows with penicillin. The routine treatment of all cows at the "drying off" stage has also been found to reduce the incidence during the dry period and immediately after calving. Acute sporadic cases do, however, continue to appear, particularly in high yielding animals and although many of these cases respond to massive doses of penicillin or aureomycin, permanent damage is invariably done to the affected quarter or quarters which not only reduces the yield from affected quarters, but renders them more susceptible to subsequent infections. These acute sporadic cases are usually seasonal and occur during the rainy months when flies are numerous but also occur whenever there is any relaxation of good management and milking technique.

2. Sterility in Dairy Cows:

Investigations into the high incidence of sterility in dairy cows revealed that Trichomoniasis, a venereal disease of cattle, was very prevalent throughout the Island. The majority (21) of the (24) bulls maintained at the Central Livestock Station and the six District Agricultural Stations were found to be infected, in addition to several other bulls in privately-owned dairies and on plantations. Infection did not always result in absolute sterility but usually rendered the animals difficult to get in calf and there were occasional early (2—3 months) abortions. Since there was no known reliable treatment for the disease in infected bulls, it was decided to slaughter them all and expand the artificial insemination unit at the Central Livestock Station, using bulls which have never been allowed to serve naturally. Semen is delivered to the six District Agricultural Stations for the insemination of cattle formerly brought there for

natural service. Visits are made from the Central Livestock Station to inseminate the cattle of owners who find it difficult to send their animals to one of the stations.

Numbers of cattle inseminated during the year and corresponding figures for the previous year are as follows :—

TABLE I.

Year	Central Livestock Station	Groves	The Home	Jerusalem	Sayes Court	Haggatts	Bullen
1952-53 ..	410	310	204	196	52	24	—
1953-54 ..	1,173	371	126	116	70	79	51

The use of good quality semen from bulls that are known to be free from venereal disease has been followed by an improvement in fertility. The results have not been entirely satisfactory in all cases, however, compared with European standards and the factors concerned are being investigated. In many cases it is probable that previous infection may have resulted in permanent damage to the reproductive organs. In many cases, particularly in the peasant owned cattle, poor feeding standards and too little concentrates is a frequent cause of sterility. Investigations into the possibility of mineral deficiencies or unbalances are continuing.

The infertility problem of the cattle of the Central Livestock Station, following a severe outbreak of Trichomoniasis in the herd, has improved but has, by no means, yet disappeared. Comparisons for the last two years are shown in Table II.

TABLE II.

	1952-53	1953-54
Number of cows conceiving after one insemination	5 out of 33	6 out of 26
Number of heifers conceiving after one insemination	5 out of 7	6 out of 11
Combined conception rate for cows and heifers based on first service	25.0%	32.4%
Average number of inseminations required to get each animal in calf	4.5	3.8
Number of sterile cows sold for slaughter ..	5	2

3. Trichomoniasis:

Twenty-one cases of Trichomoniasis were confirmed in bulls and cows during the year under review. No new cases were confirmed in Government-owned livestock; and artificial insemination only is being employed on these cattle.

4. Johne's Disease:

Blood serum from all cattle at the Central Livestock Station was submitted to the Ministry of Agriculture Veterinary Laboratory at Weybridge, following a relatively high incidence of clinical cases of the disease during the last few years. The Complement Fixation Test for Johne's Disease Antibodies showed that 9 out of 89 animals tested were positive reactors. Of these, 7 have been disposed of for slaughter, and the remainder will be disposed of as soon as it is considered economical to do so. Further samples will be submitted and it is expected that in a short time it will be possible to eliminate the disease from the herd.

5. Tuberculosis:

The routine annual test on all Government-owned cattle revealed that there was no evidence of infection of bovine tuberculosis and all animals passed the test.

6. Newcastle Disease:

There was a serious outbreak of Newcastle disease in poultry in St. Michael in June, 1953. Outbreaks occurred simultaneously in several other Caribbean territories. The disease was confirmed by the Connaught Veterinary Research Laboratory a few days after losses had been first reported. The disease did not spread or cause as high a mortality as the epidemic of fowl cholera and typhoid caused the previous year. Following precautionary methods advised by the Department to limit the spread of infection, the disease disappeared after a few weeks.

Importations of Meat and Meat Products:

Permits for the importation of all meat and meat products from scheduled countries continue to be issued by the Department, and during the year it was found necessary to discontinue importations of uncooked pork and pork-products from the United States of America as a result of outbreaks of Vesicular Exanthema among swine in that country.

Importation and Exportation of Animals:

As a result of stricter control over the importation of animals, certain diseases which frequently made their appearance in the Colony did not occur during the year under review. Tables III and IV indicate the numbers and types of animals inspected prior to export and on arrival in the Colony.

TABLE III.

Veterinary Inspection of Animals prior to Export

Dogs	Cats	Horses	Cattle	Sheep	Goats	Pigs
49	1	90	7	21	28	3

TABLE IV.

Veterinary Inspection on arrival of Imported Animals

Dogs	Cats	Horses	Cattle	Sheep	Goats	Pigs	Mules	Asses
22	3	117	7	1	4	9	23	22

SECTION X.

FISHERIES

By

D. W. WILES

Fishery Officer

The work of the Fisheries Division for the financial year is reviewed under the following headings:—

- A. Loans to Fishermen
- B. Research Work
- C. Conferences
- D. Markets and Marketing
- E. Cold Storage
- F. Fishing Industry Act 1952:
 - (a) Regulations.
 - (b) Registration of Fishing Boats.
 - (c) Registration of Fishermen.
 - (d) Loss of Boats.
 - (e) Loss of Life.
- G. Cost of Calvert Type Boats
- H. General.

A. Loans to Fishermen.

During the financial year 1953-54, thirty-eight (38) loans were granted under the provisions of the Fishing Industry Act amounting to \$9,740.34 for the repairing and refitting of thirty-two boats and assisting with the building of six new ones. One powered fishing boat was launched.

Repayments for the same period amounted to \$10,462.00 of which \$1,978.47 was repaid to Redemption of Loans and \$8,483.53 to the Revolving Fund. One thousand, one hundred and forty dollars and four cents (\$1,140.04) was repaid to the Emergency Fund.

The financial position in respect of each of these funds at 31st March, 1954, is as follows:—

	Amt. actually expended	Amount repaid	Balance
Redemption of Loans	\$77,788.69	\$64,193.29	\$13,595.40
Revolving Fund	73,280.80	30,421.56	42,859.24
Emergency Fund	58,904.76	2,115.87	56,788.89

B. Research Work:

After Mr. Hall's return to the United Kingdom, "Investigator" continued to carry out research in relation to the flying fish fishery, especially in connection with the exploring of different techniques for the capture of this fish.

The ring gill net was used with improved efficiency and longer gill nets were applied with improved results. Later in the year, November—February, king fish investigations were continued with weighted lines being used at different depths. This method showed considerable promise.

C. Conferences:

During the month of November, the Fishery Officer attended the joint session of the Food & Agricultural Organisation and the Gulf & Caribbean Fisheries Institute which was held in Miami, Florida. Much useful information was gained at this Conference. The value of the contact with an Organisation such as the Gulf & Caribbean Fisheries Institute cannot be too strongly stressed, as the personnel at the meetings are all there on some aspect of fishery promotion.

D. Markets and Marketing:

Bridgetown Fish Market : Returns through the Bridgetown Fish Market showed a satisfactory year. During the early months of the 1954 fishing season, catches were moderate, but improved later. It is observed that whenever the fishing season is off to a slow start, due to unfavourable currents prevailing, the season is usually of longer duration and extends into the later part of July.

Returns of fish marketed through the Bridgetown Market up to 6.00 p.m. for the last two financial years, are as follows:—

1952-53				1953-54			
Landings	Month	Amt. of Lb.		Landings	Month	Amt. of Lb.	
49	April	68,751		586	April	141,635	
234	May	42,005		246	May	68,114	
159	June	26,341		113	June	26,478	
41	July	7,055		6	July	960	
9	August	2,142		4	August	2,323	
7	September	675		—	September	—	
7	October	980		4	October	1,554	
25	November	3,020		42	November	4,878	
255	December	48,682		78	December	12,871	
434	January	89,736		155	January	19,407	
363	February	50,943		209	February	34,851	
621	March	117,559		244	March	46,237	

Large quantities of fish are marketed through this centre after 6.00 p.m. and no records are taken.

Oistins Market : It has taken longer than was expected for the fishermen and boat-owners to appreciate the value of making full use of this Market. However, there was a better response during the 1954 fishing season.

Speightstown Fish Market : This new market was opened in January 1954 and immediately met with the co-operation of fishermen and boat-owners of the area. So far, for every month, January — June inclusive, this market

has topped the returns of the Bridgetown Fish Market. It is accordingly indicated that only a very small percentage of boats landing fish in the St. Michael area, use the Bridgetown Fish Market, while the majority of a much smaller group of boats use the Speightstown Market. The returns for this market for the period January — March are as follows:—

Landings	Month (1954)				lbs.
158	January	..	..	..	8,173
451	February	..	..	..	49,672
508	March	..	..	..	51,553

Beach Shelters: Landings recorded at the five beach shelters have shown an improvement over previous years. The following table shows the approximate amount of fish landed at these centres:—

Month	Consetts Bay	Payne's Bay	Reid's Bay	Skeete's Bay	Martins Bay
	lb.	lb.	lb.	lb.	lb.
1953					
April	16,400	11,377	8,733	49,257	22,059
May	10,400	11,830	10,683	15,000	18,394½
June	5,800	7,377	5,831	10,935	9,281
July	1,554	2,026	1,963	1,145	1,200
August	650	2,916	1,233	655	2,413
September ..	450	581	734	—	—
October	52	99	110	1,408	587
November ..	730	1,383	425	371	212
December ..	110	4,756	1,600	207	1,954
1954					
January	1,366	1,131	900	2,804	3,866
February	3,400	5,380	4,100	8,114	5,071
March	3,950	9,361	3,217	13,817	9,461

Experiments with storing fish under Deep Freeze conditions at 0° F.

During the fishing season 1953—54, experiments were carried out with the storage of flying fish, dolphin and king fish. The king fish and dolphin were subjected to short term storage of six weeks due to the necessity to defrost the machine after that period. Such fish were sampled after this period. They had lost 10% in weight and appeared dry, but on thawing out, were very firm and mellow and very good in quality. Hardly any difference between fresh and stored fish can be noticed in the taste of these species.

Results of Flying Fish Storage.

With the deep freeze operating at approximately 0° to 5° F., these fish kept very well and were held for periods up to three months. The whole fish were less dry than the cut pieces, which suffered a loss of weight and dehydration, due to having more cut surfaces exposed. It was found that the cut fish could be glazed and some of the drying was prevented, but this was defeated as with one deep freeze unit which had to be defrosted every six weeks at least, the glaze was lost during this defrosting operation. This would not be necessary in a storage plant which would have extra space to accommodate stocks when defrosting became necessary.

Flying fish were stored in a number of ways and conditions:—

- | | |
|-----------|--------------------------------|
| 1952-53 | (1. Whole fish |
| Programme | (2. Whole but gutted fish |
| | (3. Boned fish. |
| 1954 | (1, 2 & 3 as above. |
| Programme | (4. In the round but heads off |
| | (5. Gutted but heads off. |

Results: (1952-53)

Whole Fish: Fish were held at 0° to 5° F. for approximately three months and after two defrostings of the deep freeze unit (approximately 2 hours), the fish were very good. Such fish have been carried by bus as far as St. Lucy and have been reported on favourably. Bones appear to be a minor problem. If the fish are allowed to thaw out fully before this boning operation, the fish become somewhat softer and the flesh may pull if a dull knife is used. When using a sharp boning knife and working ahead of the complete thaw, the fish boned perfectly and behaved as if they were fresh. However, both of the above were a good frozen product and point the way for much larger storage of flying fish.

Whole but gutted fish: Fish were held at 0° to 5°. for 3 — 4 months and were defrosted thrice at intervals of six weeks. Tests were carried out at frequent intervals during this period and at all times the eating quality of the fish was regarded as excellent.

It is felt that due to defrosting, the whole (non-gutted) fish thaws and the blood of the gut sections has an opportunity to enter the flesh on account of expanded flesh pores, hence a fishy flavour which may be noticeable in the eating if this fish has undergone two or more defrostings —thus the preference for the gutted fish.

Boned Fish: Boned fish were quite good up to one month, but dried after this period, and lost some flavour. However, boned fish that were glazed, were as good as the fresh product. Defrosting again presented a problem, as with a thaw, the glaze was lost and glazing was required again. If the fish were reglazed as soon as frozen again, hardly any difference in flavour could be noticed, but if reglazing was delayed, there was an immediate dehydrating effect, causing a shrinkage and loss of weight — hence a smaller marketable fish.

Conclusions:

Many storage problems have presented themselves; chief among these is the sticking together of fish.

Sticking is a very real problem and instantly presents the need for wrapping or packing of fish if stored in large quantities. At 0° F., fish become very hard and cannot be broken apart unless tap water is poured on them or they are allowed to thaw, both of which would be undesirable, if the product is to travel further.

Defrosting presented a major problem and the complete storage was twice subjected to two hours of warm air due to the need of defrosting the unit. In any storage plant that might be envisaged, extra accommodation should be available to enable the defrosting of a storage room to take

place without endangering the fish under storage, by means of an easy transfer to another cold room maintained at a similar temperature.

The results achieved even under difficult conditions were good, and the majority of the stored flying fish have been as good as the fresh product. The large pelagic species, dolphin and king fish (wahoo), seem to improve in texture after ten days of storage.

In spite of all the problems which must naturally develop, fish products, quick-frozen at 28° F. and then stored at even 10° F., would provide a greater outlet for seasonal catches and a supply of fish over a greater part of the year.

F. Fishing Industry Act, 1952:

Regulations made in April 1953 to Act of 1952:

During the year provision was made through the Fishing Industry Act, 1952, by approved regulations whereby loans for the purpose of repairing and completing the construction of a fishing boat, or for purchasing material, gear, or tackle, could be made to fishermen, approved by the Fisheries Advisory Committee.

Loans for gear must be repaid during a fishing year, and loans not exceeding \$500.00 shall be repaid in four consecutive years in the following proportions—1st year 30%; 2nd year 30%; 3rd and 4th years 20% each.

Any loan exceeding \$500.00 for the completing of a fishing boat shall be further secured by a mortgage against real or personal property other than the fishing boat, to the satisfaction of the Governor-in-Executive Committee and repayments shall be made yearly not exceeding five years. At any time an instalment becomes due, and is not repaid, the entire loan becomes due and payable forthwith.

(b) Registration of Fishing Boats.

The following flying fish boats have been registered with the Fisheries Division for the year 1953-54:—

St. Michael	..	..	..	..	131 boats
St. James	..	..	..	..	89 "
St. Peter	..	..	..	..	40 "
St. Lucy ..	..	..	..	..	46 "
Christ Church	..	..	..	..	66 "
St. Philip	..	..	..	..	61 "
St. John	..	..	..	..	28 "
St. Joseph	..	..	..	..	35 "
					496 boats

(c) Registration of Fishermen.

The number of fishermen registered with the Fisheries Division is 1,039. This total is still short of the number engaged in fishing and it will be some time before complete registration is effected.

(d) Loss of Boats.

Eight boats were lost during the period under review. Some of these unfortunate incidents were the result of heavy winds and rough seas.

(e) Loss of Life.

As a result of some of the above losses, it is regretted that four men lost their lives.

G. Cost of Calvert Type Boats.

During the year, the cost of the Calvert boats was finalised. These twenty-nine boats cost \$1,680.00 each.

H. General.

Dr. C. F. Hickling's Visit: In March of 1954, Dr. C. F. Hickling, Adviser to the Secretary of State on Colonial Fishery Matters, visited the Island for a five-day inspection. He was shown the various phases of development since his last visit in 1949.

At a special meeting of the Fisheries Advisory Committee which was attended by Dr. C. F. Hickling and the Hon. Minister of Agriculture & Fisheries, Dr. Hickling made the following observations:—

- (1) He was enthusiastic over the success of the gill net in the capture of flying fish and suggested that further experiments should be carried out with longer nets.
- (2) He was also conscious of the gradual mechanisation of the fishing fleet and suggested further encouragement.
- (3) As a result of further improvements in the catches of fish, it would soon be necessary to examine the possibilities of storage.

Dr. Hickling's Report is awaited.

Fishery Officer's Remarks.

On the whole the year has been satisfactory, both from the quantity of fish landed, as well as general progress with plans for future developments.

Small powered boats have proved very definitely that they can outfish and out-mancoeuvre the sail type fishing boat; further the maintenance of the powered boat is less than of the sail boat. The powered boat is also the easier to operate, only requiring two men, and may be used during periods of calm and the hurricane months with success. It is considered that it will not be long before powered boats are generally accepted by the fishermen and the desire to build powered type boats becomes Island wide.

With the introduction of powered boats, fishermen can more easily return to the area where fish were seen the day before and are in a more favourable position for tracking the current in which the fish are travelling. This development is important to the Island and will result in the capture of many more thousands of fish.

PART IV.

FINANCIAL STATEMENT

Expenditure and Revenue for the Financial Year 1953-54.

EXPENDITURE

Recurrent

Personal Emoluments	\$148,379.46
Cost of Living Allowance	13,744.77
Travelling Allowances	21,952.96
Exhibition Expenses	1,449.50
Expenses in Control of Cotton Diseases (Salaries of Sub-Inspectors)	900.00
Unforeseen Contingencies	—
Stationery	1,463.05
Library	937.18
Destruction of rats and beetles	1,000.00
Experimental Stations	60,018.05
Chemical Laboratory	6,389.83
Entomology	15,353.14
Fisheries	18,221.71
Veterinary	952.44
Government Lands (Upkeep and Purchase of Grass)	355.72
Pine Plantation and Central Livestock Station	137,072.97
District Agricultural Stations	47,087.92
Propagation of Trees	1,795.26
Tax Contribution Payments	1,380.21
Subsidy Payments	1,804.35
Cleaning Sucks at Seawell	150.00
	\$480,408.52

Non-Recurrent

Equipment for Veterinary Laboratory	\$ 196.20
" " Chemical	3,149.44
Furniture and Equipment	865.27
Agricultural Development Schemes	6,172.45
Garden Book of Barbados	1,200.00
Eradication of Ratoon Stunting Disease of Sugar Cane	1,246.37
Platform Scales	940.00
Anemometer	40.00
Radio Telephone Equipment	225.18
Re-arrangements and alterations at Government Laboratory	42.25
Preparation of Land at Seawell	12.00
	\$ 14,089.56

REVENUE

Codrington Experimental Station--Field Produce	\$ 12,259.31
Botanic Station:	
Ornamental & Useful Plants	1,080.69
Deposits on plant pots	2,587.52
Vegetable Seed & Insecticides	16,497.15
Proceeds from Sale of Casuarina trees, etc	332.52
Chemical:	
Analyses of Sugar & Molasses	2.40
Analyses of Miscellaneous Samples	430.80
Entomological:	
Fumigation of bags for export	27.30
Sale of old wheat	258.17
Inspection of private buildings for Wood Ants	76.80
Pine Plantation & Central Livestock Station	99,280.93
District Agricultural Stations	22,973.18
Co-operatives--Fees, etc.	43.78
	\$155,850.55

AGRICULTURAL LEGISLATION

The Sugar Industry (Labour Welfare) (Special Levy) Act, 1953 (1953-4).

An additional levy on all sugar and molasses manufactured in the Island during the year 1952 is imposed by this Act and is made payable in the first instance to the Sugar Production and Export Control Board and then to the Governor-in-Executive Committee to be applied to the Labour Welfare Fund formed by Section 19 of the Sugar Industry (Rehabilitation, Price Stabilization and Labour Welfare) Act, 1947.

The Sugar Industry (Rehabilitation, Price Stabilization and Labour Welfare) (Local Consumption) (Amendment) Act, 1953 (1953-20).

This Act amends Section two of the Sugar Industry (Rehabilitation, Price Stabilization and Labour Welfare) (Local Consumption) Act, 1952 in order that the provisions contained therein may apply to the year 1953.

The Barbados Fancy Molasses Production and Export (Amendment) Act, 1953 (1953-30).

This Act amends the definition of the expression "fancy molasses" and also alters the constitution of the Fancy Molasses Control and Marketing Board. It imposes a levy on all fancy molasses produced in the Island in order to provide funds for expenses incurred in carrying out the provisions of the Act, and under Regulations made by the Board, makes provision in respect of:—

- (a) the securing of alternative employment for labour displaced by bulk shipment of fancy molasses;
- (b) the payment of interest and depreciation on capital involved in providing bulk storage in this Island or elsewhere;
- (c) the fixing of the price of fancy molasses and any subsequent adjustment in relation to the price of sugar;
- (d) preventing fluctuations in the price of fancy molasses owing to minimum crops.

The Underground Water (Repeal) Act, 1953 (1953-35).

This Act repeals the Underground Water Act, 1922.

The Barbados Sugar Producers (Conveyance of Vacuum Pan Molasses by Pipeline) Act, 1954 (1954-17).

This Act authorises the Barbados Sugar Producers' Association to construct and maintain a pipeline or pipelines for conveying vacuum pan molasses from a point ashore to vessels in the harbour under certain conditions.

PART VI.

LIST OF PUBLICATIONS ISSUED BY THE DEPARTMENT OF SCIENCE AND AGRICULTURE AND B.W.I. CENTRAL SUGAR CANE BREEDING STATION FROM 1925 TO DATE

Department of Science and Agriculture

Reports

- Report on the Sugar Cane Experiments for the season between 1923--25,
by J. P. D'Albuquerque, M.A., F.I.C., F.C.S.
- Report on the Sugar Cane Experiments for the Season between 1924--26,
by J. P. D'Albuquerque, M.A., F.I.C., F.C.S.
- Report on the Dept. of Agriculture, Barbados, 1925--26.
- Annual Report of the Department of Agriculture, 1926--27.
- Report of the Department of Agriculture, Barbados, 1927--28.
- Annual Report of the Department of Science and Agriculture, 1928--29.
- Report of the Department of Science and Agriculture, Barbados, 1929--30.
- Report of the Department of Science and Agriculture, Barbados, 1930--31.

Agricultural Journals:

- Vol. 1, No. 1,
Jan. 1932
(out of print) An Investigation into the Evolution of Sugar Cane Varieties by Breeding
in Barbados, 1887--1925, with a discussion on the application of the
Findings to the present day Scheme of Work, by A.E.S. McIntosh,
B.Sc., Ph.D.
- A Survey of the Position of *Phytalus smithi*, Arrow and its Natural
 Enemies in Barbados, by R. W. E. Tucker, M.A., B.Ed.
- The Scientific Control of Pan Boiling, by S. J. Saint, M.Sc., Ph.D.
- The Status of *Trichogramma* as a control of *D. saccharalis* in Barbados, by
 R. W. E. Tucker, M.A., B.Ed.
- The Inversion of Sucrose in Syrup Manufacture, by C. A. Coppin, B.A.Sc.
- Some Aspects of the Flora of Barbados, by F. Hardy, M.A., F.G.S.
- Memorandum on the Cotton Situation in Barbados.
- Vol. 1, No. 2,
April 1932 Report on the Work of the Department of Science and Agriculture for
 the Year Ending June 30, 1932.
- Some Aspects of the Flora of Barbados (Cont'd) by F. Hardy,
 M.A., F.G.S.
- Vol. 1, No. 3,
July 1932 Report of the Geneticist for 1931--32.
 Some Aspects of the Flora of Barbados (Cont'd.) by F. Hardy, M.A.,
 F.G.S.

- Vol. 1, No. 4, Oct. 1932. A Discussion of the Results of Manurial Trials carried out on Sugar Cane in Barbados, 1928—32.
Some Aspects of the Flora of Barbados (Cont'd), by F. Hardy, M.A., F.G.S.
- Vol. 2, Nos. 1 & 2, April 1933. Report on the Work of the Department of Science and Agriculture for the Year Ending June 30, 1933.
Some Aspects of the Flora of Barbados (Concluded) by F. Hardy, M.A., F.G.S.
- Vol. 2 No. 3, July 1933. Report of the Geneticist for the Year 1932—33.
- Vol. 2, No. 4, Oct. 1933. Manurial Trials with Sugar Cane, by S. J. Saint, M.Sc., Ph.D.
Rate of Egg Deposition of *D. saccharalis* and Extent of Larval Mortality in Canefields and their relation to Control of *Diatraea* by *T. minutum*, by R. W. E. Tucker, M.A., B.Ed.
Varietal Factors in Cane which may influence extent of Oviposition by *D. saccharalis* and a possible method for Determining Varietal Susceptibility to Borer attack, by R. W. E. Tucker, M.A., B.Ed.
- Vol. 3, No. 1, Jan. 1934. Sugar Cane Growth Measurements in Barbados, by A. E. S. McIntosh, B.Sc., Ph.D.
A Contribution towards the Solution of the Problem of Control of the real mortality of *D. saccharalis* due to egg parasites, egg predators, natural larval mortality, larval parasitism and other factors, by R. W. E. Tucker, M.A., B.Ed.
- Vol. 3, No. 2, April 1934. Report on the Work of the Department of Science and Agriculture for the Year Ending March 31, 1934.
- Vol. 3, No. 3, July 1934. The Coral Limestone Soils of Barbados by S. J. Saint, M.Sc., Ph.D.
- Vol. 3, No. 4, Oct. 1934. Report of the Geneticist for the Year 1933—34.
(out of print) A further Contribution to the Analysis of Field Data on *D. saccharalis* in Barbados, by R. W. E. Tucker, M.A., B.Ed.
- Vol. 4, No. 1, Jan. 1935. Manurial Trials with Sugar Cane.
(out of print) The Control of *D. saccharalis* in Sugar Cane in Barbados by frequent liberation of mass-reared *Trichogramma*, by R. W. E. Tucker, M.A., B.Ed.
- Vol. 4, No. 2, April 1935. Report on the Work of the Department of Science and Agriculture for the Year ending March 31, 1935.
- Vol. 4, No. 3, July 1935. Report of the Geneticist for the Year 1934—35.
- Vol. 4, No. 4, Oct. 1935. Manurial Trials with Sugar Cane.
Sugar Cane. A Summary of Plantation Variety Yield Returns for Season 1933—35, by A. E. S. McIntosh, B.Sc., Ph.D.
Juice Analyses in Relation to the Fertilizer Requirements of Barbados Soils by S. J. Saint, M.Sc., Ph.D.
- Vol. 5. No. 1, Jan. 1936. Parasites Introduced into Barbados for Control of Insect Pests, by R. W. E. Tucker, M.A., B.Ed.
(out of print) Investigations into the Use of the Zeiss Hand Refractometer, by A. E. S. McIntosh, B.Sc., Ph.D., and G. C. Stevenson, B.A.
- Vol. 5 No. 2, April 1936. Report on the Work of the Department of Science and Agriculture for the Year Ending March 31, 1936.
- Vol. 5 No. 3, July 1936. The Yield of Sugar Cane in Barbados in 1936.
Report of the Botanist for the Year 1935—36.
- Vol. 5 No. 4, Oct. 1936. A Preliminary Investigation into Cane Varieties and Infestation by *D. saccharalis*, by R. W. E. Tucker, M.A., B.Ed.
(out of print)

- Vol. 6 No. 1,
Jan. 1937
(out of print) Manurial Trials with Sour Grass, by S. J. Saint, M.Sc., Ph.D.
Manurial Trials with Sugar Cane, by S. J. Saint, M.Sc., Ph.D.
Sugar Cane Spacing Experiments, by G. C. Stevenson, B.A.
- Vol. 6 No. 2,
April 1937.
(out of print) Report on the Work of the Department of Science and Agriculture
for the Year Ending March 31, 1937.
- Vol. 6 No. 3,
July 1937. The Yield of Sugar Cane in Barbados, 1937.
Report of the Botanist for the Year 1936—37.
- Vol. 6 No. 4,
Oct. 1937.
(out of print) The Control of Scarabee in Barbados, by R. W. E. Tucker, M.A., B.Ed.
Larval Dispersion of *D. saccharalis*, by R. W. E. Tucker, M.A., B.Ed.
- Vol. 7 No. 1,
Jan. 1938. Manurial Trials with Sugar Cane, by S. J. Saint, M.Sc., Ph.D.
An Account of an Experiment to Determine the Efficiency of two
Weed-killing Sprays.
Experiments with the Dwarf Banana.
String Bean Variety Trial, Codrington, 1937.
Experiments in the Use of Hortomone A to Stimulate Rooting and
Establishment in Cutting of Ornamental Plants.
- Vol. 7 No. 2,
April 1938.
(out of print) Report on the Work of the Department of Science and Agriculture
for the Year Ending March 31, 1938.
- Vol. 7 No. 3,
July 1938. The Yield of Sugar Cane in Barbados in 1938.
Report on Sugar Cane Breeding and Seedling Testing for the Year
1937—38, A. E. S. McIntosh, B.Sc., Ph.D.
- Vol. 7 No. 4,
Oct. 1938.
(out of print) Experiments in the Growing of Tomatoes and shipment to Canada.
Co-operative Sugar Cane Spacing Experiments.
Sweet Potato Storage Experiments.
- Vol. 8 No. 1,
Jan. 1939. Manurial Trial with Sea Island Cotton, by S. J. Saint, M.Sc., Ph.D.
Cotton Growing and Cotton Pests Control, by R. W. E. Tucker, M.A.,
B.Ed.
The Control of *D. abbreviatus*, L. and L. (*Phytalus*) *smithi*, Arrow, in
Barbados, surveyed over a period of eleven years, by R. W. E. Tucker,
M.A., B.Ed.
- Vol. 8 No. 2,
April 1939. Report on the Work of the Department of Science and Agriculture
for the Year Ending March 31, 1939.
- Vol. 8 No. 3,
July 1939. The Yield of Sugar Cane in Barbados in 1939.
Report on Sugar Cane Breeding and Seedling Testing for the Year
1938—39, by A. E. S. McIntosh, B.Sc., Ph.D.
- Vol. 8 No. 4,
Oct. 1939. Introduction, by R. W. E. Tucker, M.A., B.Ed., of Dry Area Race of *M.*
minense into Barbados.
The Termites of Barbados, by R. W. E. Tucker, M.A., B.Ed.
Bufo Marinus, L. in Barbados, by R. W. E. Tucker, M.A., B.Ed.
- Vol. 9 No. 1,
Jan. 1940. Manurial Trials with Sugar Cane, by C. B. Johnston, B.Sc.
- Annual Report of the Department of Science and Agriculture for the year 1940—41.
- Annual Report of the Department of Science and Agriculture for the year 1941—42.
(Out of Print).
- Annual Report of the Department of Science and Agriculture for the year 1942—43.
(Out of Print).
- Annual Report of the Department of Science and Agriculture for the year Ending 31st
March, 1944.

Annual Report of the Department of Science and Agriculture for the Year 1944—45.
 Annual Report of the Department of Science and Agriculture for the Year 1945—46.
 Annual Report of the Department of Science and Agriculture for the Year 1946—47.
 Annual Report of the Department of Science and Agriculture for the Year 1947—48.
 (Out of Print).
 Annual Report of the Department of Science and Agriculture for the year 1948—49.
 Annual Report of the Department of Science and Agriculture for the Year 1949—50.
 Annual Report of the Department of Science and Agriculture for the Year 1950—51.
 (Out of Print).
 Annual Report of the Department of Science and Agriculture for the Year 1951—52. (Out
 of Print).
 Annual Report of the Department of Science and Agriculture for the year 1952—53.

Pamphlets (New Series):

- | | |
|---------------------------|--|
| No. 1, Jan.
1941 | Garden Pests of Local Importance. |
| No. 2, Jan.
1941. | Manuring of Crops. |
| No. 3. | The Identification and Treatment of the Common Diseases of the Chief
Vegetable Crops. |
| No. 4. | Compost Making. |
| No. 5.
(Out of print). | Rabbit Keeping in Barbados. |
| No. 6, Aug. | The Care and Maintenance of the Milch Goat in Barbados. |
| No. 7. | The Growing of Food Crops. |
| No. 8
(Out of print). | Hints to Cotton Growers. |
| No. 9, Oct.
1942. | The Selection and Storage of Seed Corn in Barbados. |
| No. 10, Oct.
1942. | (1) Possible Means for an Efficient Use of a Large Sweet Potato Crop.
(2) War-time Rations for Livestock.
(3) The Storage of Sweet Potatoes in Clamps. |
| No. 11, Nov.
1942. | Ways of Cooking Sweet Potatoes. |
| No. 12
(Out of print) | Recipes for the Use of Local Foodstuffs. |
| No. 13. | Recipes for the Use of Cassava Flour. |
| No. 14, Nov.
1945. | The Use of D.D.T. in Barbados. |

- No. 15, Oct. 1947. . Contour Farming.
- No. 16, Dec. 1948. Contour Cultivation in Barbados.
- No. 17, July 1949 (Out of print). Hints on the Growing of Citrus Trees.
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No. 31, Jan. 1950 (Out of print)	Report on the Sugar Cane Variety Situation in Trinidad by G. C. Stevenson, B.A., A.I.C.T.A.
No. 32, June 1950 (Out of print)	Report on the Sugar Cane Variety Situation in Jamaica, April 1950, by G. C. Stevenson, B.A., A.I.C.T.A.
No. 33, Jan. 1951.	Report on a Visit to the Sugar Cane Research Institutes of the U.S.A., November 1950, by G. C. Stevenson, B.A., A.I.C.T.A.
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No. 35, June 1951 (Out of print).	Report on a Visit to Guadeloupe, April 1951, by G. C. Stevenson, B.A., A.I.C.T.A.
No. 36, June 1951 (Out of print)	Report on a Visit to St. Lucia and Grenada. July, 1951, by G. C. Stevenson, B.A., A.I.C.T.A.

APPENDIX I.

METEOROLOGICAL OBSERVATIONS RECORDED AT THE METEOROLOGICAL STATION, CODRINGTON

Height above Sea Level 181 feet

Latitude 130° 7' 36" N. Longitude 59° 35' 57" W.

The following are the summaries of the observations recorded for the year 1953. The details are given in Appendix II.

Barometric Pressure. The records refer to observations made at the hours of 9.00 a.m. and 3.00 p.m. only, and are expressed in inches of mercury. During the year 1953 the mean pressure corrected for temperature and gravity and reduced to sea level was at 9.00 a.m. 29.970 and at 3.00 p.m. 29.894, the highest pressure recorded being 30.115 on the 22nd February and the lowest 29.762 on 13th December. For the ten-year period 1943-1952 the average barometric pressure was at 9.00 a.m. 29.976 and at 3.00 p.m. 29.903, the highest pressure recorded at 9.00 a.m. during the ten-year period was 30.131 on the 21st of February, 1946, and the lowest pressure recorded at 3.00 p.m. was 29.658 on the 12th of November, 1946.

Temperature. The daily mean maximum temperature for the year 1953 was 85.0°F. and the daily mean minimum 72.8°F. The maximum extreme for the year was 89.0°F. registered on the 11th April; and the minimum extreme 65.5°F. registered on the 4th January and 11th February. The average monthly mean temperature was 78.9°F., the highest monthly range 21.5°F. and the lowest 15.0°F.; the mean monthly range being 17.9°F. For the ten-year period 1943-1952 the daily mean maximum was 85.2°F. and the daily mean minimum 72.3°F. During the same ten-year period the average monthly mean temperature was 78.6°F.; the maximum extreme was 95.0°F. on the 21st August, 1943; the minimum extreme was 60.5°F. on the 29th February, 1944, and the 11th and 15th January, 1949; and the average monthly range 19.1°F.

Tension of Vapour and Relative Humidity. The mean tension of vapour for the year 1953 was at 8.00 a.m. .765 and at 4.00 p.m. .736. The mean relative humidity was at 8.00 a.m. 75.3 per cent and at 4.00 p.m. 68.3 per cent.

Wind. The daily- (24-hour period) mean velocity of the wind during the year 1953 was 8.7 miles an hour. Records were kept of half-daily or twelve-hour periods from 6.00 a.m. to 6.00 p.m. and 6.00 p.m. to 6.00 a.m. The maximum velocity for any such twelve-hour period was 21.2 miles an hour recorded between 6.00 a.m. and 6.00 p.m. on the 21st of February—and the minimum velocity 2.1 miles an hour recorded between 6.00 p.m. and 6.00 a.m. on the 30th of September. The average daily (24-hour period) velocity for the ten-year period ended 1952 was 9.1 miles an hour.

Rainfall. The rainfall measures at the Government Meteorological Station during the year, 1953, amounted to 57.98 inches. Rainfall was recorded on 208 days, the greatest fall being 3.74 inches on the 8th of November. For the ten-year period 1943-1952 the average total rainfall was 52.74 inches, and the average number of days annually on which rain fell was 188.

Rainfall of the Island. The average total rainfall for the year 1953 from 68 stations was 66.18 inches, being 6.03 inches above the average for one hundred years ended December 31, 1952, which was 60.15 inches. Details are given in Appendix III.

APPENDIX II.
Meteorological Report for 1953

MONTH	Barometric Pressure Reduced to 32°F Latitude 45° and Mean Sea Level					TEMPERATURE OF								TENSION OF VAPOUR			RELATIVE HUMIDITY			Velocity Miles per Hour	Daily Mean Sunshine (hours)	Rainfall (Inches)	No. of Days on which Rain fell
	9 a.m.	3 p.m.	Mean	Highest	Lowest	Max. Mean	Min. Mean	Max. Extreme	Min. Extreme	Mean for Month	Range for Month	Dew Point 8 a.m.	Dew Point 4 p.m.	8 a.m.	4 p.m.	Mean	8 a.m.	4 p.m.	Mean				
January	30.017	29.931	29.974	30.079	29.870	82.8	71.3	84.0	65.5	77.0	18.5	68.1	66.8	.693	.660	.676	75.5	66.8	71.1	10.8	8.6	2.17	19
February	30.010	29.929	29.969	30.115	29.879	83.5	70.4	85.0	65.5	76.9	19.5	65.4	64.9	.620	.631	.625	67.5	60.5	64.0	11.6	9.3	0.82	11
March	29.990	29.907	29.948	30.071	29.864	84.6	71.5	86.5	68.0	78.0	18.5	67.7	66.2	.681	.646	.663	71.3	61.5	66.4	11.8	8.7	1.54	20
April	29.981	29.904	29.942	30.042	29.814	87.0	72.3	89.0	67.5	79.6	21.5	68.0	66.6	.689	.652	.670	65.1	56.9	61.0	9.4	10.0	0.23	6
May	29.965	29.898	29.931	30.023	29.857	86.8	74.7	88.5	71.5	80.7	17.0	71.2	69.8	.764	.733	.748	71.5	64.9	68.2	8.0	7.3	1.97	17
June	29.989	29.928	29.958	30.042	29.868	86.7	73.8	88.5	70.5	80.2	18.0	71.4	70.2	.770	.737	.753	70.9	64.3	67.6	9.5	9.0	4.63	19
July	29.938	29.913	29.960	30.051	29.868	85.3	73.9	87.5	69.5	79.6	18.0	73.8	72.3	.831	.796	.813	79.4	72.6	76.0	8.3	7.7	11.99	28
August	29.976	29.915	29.945	30.037	29.819	85.3	74.1	87.5	72.5	79.7	15.0	73.5	72.8	.828	.808	.818	78.0	72.5	75.2	7.9	8.5	7.01	18
September	29.927	29.851	29.889	29.997	29.764	85.0	74.4	88.0	71.0	79.7	17.0	74.7	73.2	.858	.819	.838	80.6	77.1	78.8	7.2	6.2	8.26	21
October	29.924	29.838	29.881	29.980	29.787	85.1	73.2	87.5	70.0	79.1	17.5	74.5	72.6	.856	.807	.831	81.8	75.1	78.4	5.9	5.9	6.07	17
November	29.929	29.841	29.885	29.968	29.795	84.7	72.6	86.5	70.5	78.6	16.0	74.1	73.0	.848	.822	.835	84.7	76.9	80.8	5.8	7.4	10.23	15
December	29.941	29.856	29.898	30.016	29.762	83.1	71.3	84.5	66.5	77.2	18.0	70.1	69.2	.741	.717	.729	77.7	70.3	74.0	7.9	8.2	3.06	17
TOTAL	359.637	358.731	359.180	360.421	357.947	1019.9	873.5	1043.0	828.5	946.3	214.5	852.5	837.6	9.179	8.828	8.999	904.0	819.4	861.5	104.1	96.8	57.98	208
AVERAGE	29.970	29.894	29.932	30.035	29.829	85.0	72.8	86.9	69.0	78.9	17.9	71.0	69.8	.765	.736	.750	75.3	68.3	71.8	8.7	8.1	4.83	17

APPENDIX III.

Barbados Rainfall from January to December 1953

NAME OF STATION	Number of Stations	January		February		March		April		May		June		July		August		September		October		November		December		TOTAL.	
		Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches	Days	Inches
DISTRICT "A"—St. Michael Lowlands	6	15	2.48	10	1.26	13	1.59	5	.46	12	2.28	14	4.61	23	10.45	16	7.67	19	8.90	16	6.02	15	10.25	14	3.79	172	59.76
DISTRICT "B"—Christ Church Lowlands	7	12	2.77	11	1.72	11	1.58	3	.65	12	2.29	14	4.60	21	9.35	14	7.84	20	7.52	14	4.74	17	8.69	12	4.54	161	56.30
—St. George Highlands	2	20	4.69	16	2.47	19	2.72	7	.76	17	2.36	16	6.19	26	10.19	23	10.73	23	12.80	20	6.39	22	13.58	17	4.83	226	77.80
Lowlands	5	15	3.40	11	1.76	14	2.48	5	.54	13	2.69	15	5.63	23	11.01	18	8.36	22	8.23	18	5.76	17	11.36	13	4.28	184	65.50
DISTRICT "C"—St. Philip Highlands	2	14	3.12	9	1.39	12	1.77	6	1.31	8	1.38	13	5.88	20	8.39	16	8.56	21	8.23	14	3.40	17	12.18	14	5.66	164	61.27
Lowlands	7	14	2.46	10	1.18	11	1.94	4	.47	11	2.17	12	5.20	19	8.23	15	8.58	21	8.23	14	3.13	16	10.99	12	6.72	159	59.30
—St. John Highlands	6	18	4.34	14	2.70	18	2.19	9	.99	14	2.92	14	6.38	24	9.80	18	9.01	22	9.83	17	3.77	20	10.82	15	5.29	203	68.04
Lowlands	1	11	3.39	11	2.78	7	1.21	7	.79	11	2.04	11	6.00	20	11.09	11	10.10	16	7.89	11	3.30	16	8.73	10	4.80	142	62.12
DISTRICT "D"—St. Thomas Highlands	5	21	5.00	15	2.94	19	2.90	8	1.32	17	3.46	15	6.47	25	11.50	18	8.37	22	14.41	20	5.90	20	12.26	15	7.12	215	81.65
Lowlands	2	17	4.89	12	2.57	18	2.94	5	.81	12	3.07	14	5.42	24	10.77	16	8.18	19	13.09	16	6.17	14	11.95	12	5.44	179	75.30
—St. James Highlands	1	14	5.03	11	4.08	11	3.46	8	3.02	16	3.92	13	7.68	25	11.20	21	8.85	21	15.22	15	7.81	14	9.10	14	8.31	183	87.68
Lowlands	6	15	3.32	11	1.70	9	1.68	5	.82	11	1.81	12	4.20	22	9.41	15	7.24	20	12.11	14	4.55	14	8.84	12	4.34	160	60.02
DISTRICT "E"—St. Peter Highlands	1	9	2.02	7	.90	7	1.30	3	.24	9	1.99	11	3.14	19	7.69	14	10.22	17	9.92	13	3.87	14	9.86	8	5.19	131	56.34
Lowlands	5	16	3.32	9	2.16	13	2.14	5	.51	11	3.01	13	4.63	22	10.23	16	10.35	18	16.69	16	5.36	16	6.92	12	6.45	167	71.77
—St. Lucy Lowlands	3	9	1.69	10	1.45	8	1.15	4	.79	8	1.55	10	3.21	21	6.19	14	8.35	17	10.59	13	3.81	12	10.12	9	5.25	135	54.15
DISTRICT "F"—St. Joseph Highlands	4	18	3.31	15	2.72	13	1.98	9	1.50	15	2.44	13	5.69	23	9.42	18	7.06	19	10.75	17	4.55	17	10.67	15	5.73	192	65.82
—St. Andrew Highlands	2	15	3.17	9	2.55	12	2.22	6	1.03	10	2.78	12	5.67	25	8.96	15	9.05	21	12.69	16	5.80	16	8.02	12	5.81	169	67.75
Lowlands	3	10	1.93	8	1.64	8	1.45	4	.44	9	1.74	11	4.46	21	7.52	14	8.79	21	13.43	12	4.39	13	8.94	9	5.95	140	60.68
Totals	68	263	60.33	199	37.97	223	36.70	103	16.46	216	43.90	233	95.06	403	171.40	292	157.31	359	200.62	276	88.72	290	183.28	225	99.50	3,082	1,131.25
AVERAGE		15	3.35	11	2.11	12	2.04	6	.91	12	2.44	13	5.28	22	9.52	16	8.74	20	11.15	15	4.93	16	10.18	13	5.53	171	66.18

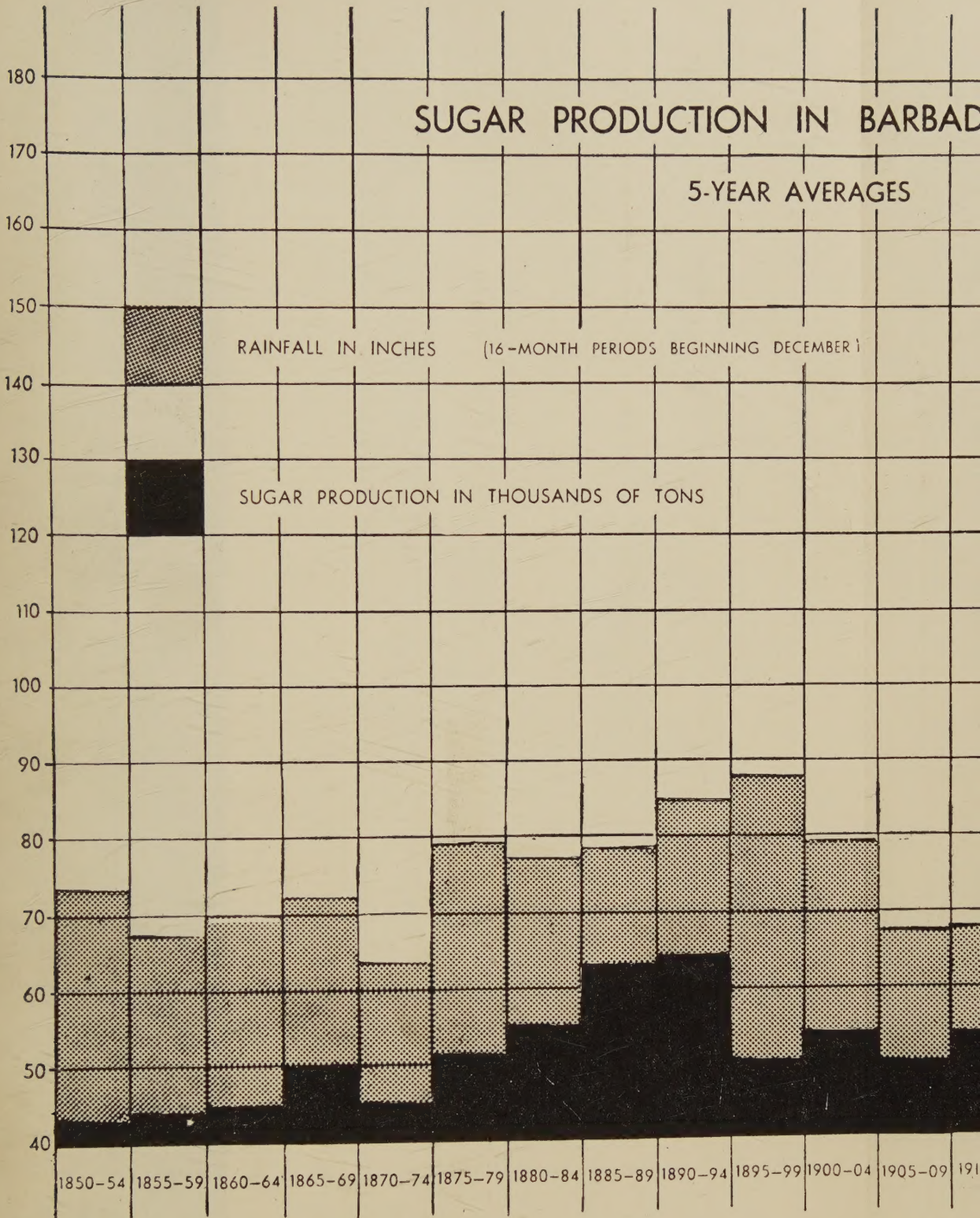
SUGAR PRODUCTION IN BARBADOS

5-YEAR AVERAGES

RAINFALL IN INCHES

(16-MONTH PERIODS BEGINNING DECEMBER 1)

SUGAR PRODUCTION IN THOUSANDS OF TONS



OS 1850-1954

